

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: George Goudreau Examiner #: 69631 Date: 8-26-05
 Art Unit: 1763 Phone Number 272-1434 Serial Number: 10-807139
 Mail Box and Bldg/Room Location: Reg 7A21 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _____

Inventors (please provide full names): _____

Earliest Priority Filing Date: _____

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

SCIENTIFIC REFERENCE BR
Sci & Tech Inf. Ctr.

AUG 26 2005

Pat. & T.M. Office

| STAFF USE ONLY | Type of Search | Vendors and cost where applicable |
|--|---|---|
| Searcher: <u>K. Fullin</u> | NA Sequence (#) <input checked="" type="checkbox"/> | STN <input checked="" type="checkbox"/> |
| Searcher Phone #: _____ | AA Sequence (#) <input type="checkbox"/> | Dialog <input type="checkbox"/> |
| Searcher Location: _____ | Structure (#) <input type="checkbox"/> | Questel/Orbit <input type="checkbox"/> |
| Date Searcher Picked Up: _____ | Bibliographic <input checked="" type="checkbox"/> | Dr. Link <input type="checkbox"/> |
| Date Completed: <u>9/15/05</u> | Litigation <input type="checkbox"/> | Lexis/Nexis <input type="checkbox"/> |
| Searcher Prep & Review Time: <u>40</u> | Fulltext <input type="checkbox"/> | Sequence Systems <input type="checkbox"/> |
| Clerical Prep Time: _____ | Patent Family <input type="checkbox"/> | WWW/Internet <input type="checkbox"/> |
| Online Time: <u>74</u> | Other <input type="checkbox"/> | Other (specify) _____ |



STIC Search Report

EIC 1700

STIC Database Tracking Number: 164045

TO: George A Goudreau
Location: 7A21
Art Unit : 1763
September 16, 2005

Case Serial Number: 10/807139

From: Kathleen Fuller
Location: EIC 1700
REMSEN 4B28
Phone: 571/272-2505
Kathleen.Fuller@uspto.gov

Search Notes



STIC Search Results Feedback Form

EIC17000

Questions about the scope or the results of the search? Contact *the EIC searcher or contact:*

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

➤ I am an examiner in Workgroup: Example: 1713
➤ Relevant prior art **found**, search results used as follows:

- 102 rejection
- 103 rejection
- Cited as being of interest.
- Helped examiner better understand the invention.
- Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- Foreign Patent(s)
- Non-Patent Literature
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art **not found**:

- Results verified the lack of relevant prior art (helped determine patentability).
- Results were not useful in determining patentability or understanding the invention.

Comments:

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=> D QUE L33
 L2 10 SEA FILE=REGISTRY ABB=ON (106392-12-5/BI OR 12033-89-5/BI OR 121-44-8/BI OR 1310-58-3/BI OR 1336-21-6/BI OR 691397-13-4/BI OR 7440-21-3/BI OR 75-50-3/BI OR 75-59-2/BI OR 7631-86-9/BI)
 L3 1 SEA FILE=REGISTRY ABB=ON SILICA/CN
 L4 2 SEA FILE=REGISTRY ABB=ON L2 AND PMS/CI
 L6 709369 SEA FILE=HCAPLUS ABB=ON L3 OR SILICA OR SIO2 OR SILICON
 ?OXIDE
 L11 2454 SEA FILE=HCAPLUS ABB=ON L6 AND NONION? (2A) SURFACT?
 L12 44 SEA FILE=HCAPLUS ABB=ON L11 AND (CMP OR CHEM? (1A) MECH? (1A) POLI
 SH?)
 L13 21 SEA FILE=HCAPLUS ABB=ON L12 AND SLURR?
 L15 65429 SEA FILE=HCAPLUS ABB=ON L4 OR ((PROPYLENE OXIDE OR PO) AND
 (EO OR ETHYLENE OXIDE)) OR NONION? (2A) SURFACT?
 L16 375 SEA FILE=HCAPLUS ABB=ON L15 AND ABRASIV?
 L17 54 SEA FILE=HCAPLUS ABB=ON L16 AND SLURR?
 L18 24 SEA FILE=HCAPLUS ABB=ON L17 AND (CMP OR CHEM? (1A) MECH? (1A) POLI
 SH?)
 L19 25030 SEA FILE=HCAPLUS ABB=ON L4 OR ((PROPYLENE OXIDE OR PO) AND
 (EO OR ETHYLENE OXIDE))
 L20 1607 SEA FILE=HCAPLUS ABB=ON L6 AND L19
 L21 14 SEA FILE=HCAPLUS ABB=ON L20 AND (CMP OR CHEM? (1A) MECH? (1A) POLI
 SH?)
 L22 39 SEA FILE=HCAPLUS ABB=ON L20 AND SLURR?
 L23 7 SEA FILE=HCAPLUS ABB=ON L22 AND POLISH?
 L24 45 SEA FILE=HCAPLUS ABB=ON L13 OR L18 OR L21 OR L23
 L25 4 SEA FILE=REGISTRY ABB=ON L2 AND 1-2/N
 L26 49123 SEA FILE=HCAPLUS ABB=ON L25
 L27 193 SEA FILE=HCAPLUS ABB=ON (L20 OR L16) AND (L26 OR AMINE#/IT OR
 (2ND OR SECOND OR TWO) (2A) SURFACT?)
 L28 15 SEA FILE=HCAPLUS ABB=ON L27 AND SLURR?
 L29 9 SEA FILE=HCAPLUS ABB=ON L28 AND (CMP OR POLISH?)
 L30 49 SEA FILE=HCAPLUS ABB=ON L24 OR L29
 L31 49 SEA FILE=HCAPLUS ABB=ON L30 AND (POLISH? OR CMP)
 L32 15 SEA FILE=HCAPLUS ABB=ON L31 AND (COMPOSITION? OR COMPNS)

L33 21 SEA FILE=HCAPLUS ABB=ON L29 OR L32

=> FILE WPIX

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=> D QUE L34

| | |
|-----|--|
| L2 | 10 SEA FILE=REGISTRY ABB=ON (106392-12-5/BI OR 12033-89-5/BI OR 121-44-8/BI OR 1310-58-3/BI OR 1336-21-6/BI OR 691397-13-4/BI OR 7440-21-3/BI OR 75-50-3/BI OR 75-59-2/BI OR 7631-86-9/BI) |
| L3 | 1 SEA FILE=REGISTRY ABB=ON SILICA/CN |
| L4 | 2 SEA FILE=REGISTRY ABB=ON L2 AND PMS/CI |
| L6 | 709369 SEA FILE=HCAPLUS ABB=ON L3 OR SILICA OR SIO2 OR SILICON ?OXIDE |
| L11 | 2454 SEA FILE=HCAPLUS ABB=ON L6 AND NONION? (2A) SURFACT? |
| L12 | 44 SEA FILE=HCAPLUS ABB=ON L11 AND (CMP OR CHEM? (1A) MECH? (1A) POLI SH?) |
| L13 | 21 SEA FILE=HCAPLUS ABB=ON L12 AND SLURR? |
| L15 | 65429 SEA FILE=HCAPLUS ABB=ON L4 OR ((PROPYLENE OXIDE OR PO) AND (EO OR ETHYLENE OXIDE)) OR NONION? (2A) SURFACT? |
| L16 | 375 SEA FILE=HCAPLUS ABB=ON L15 AND ABRASIV? |
| L17 | 54 SEA FILE=HCAPLUS ABB=ON L16 AND SLURR? |
| L18 | 24 SEA FILE=HCAPLUS ABB=ON L17 AND (CMP OR CHEM? (1A) MECH? (1A) POLI SH?) |
| L19 | 25030 SEA FILE=HCAPLUS ABB=ON L4 OR ((PROPYLENE OXIDE OR PO) AND (EO OR ETHYLENE OXIDE)) |
| L20 | 1607 SEA FILE=HCAPLUS ABB=ON L6 AND L19 |
| L21 | 14 SEA FILE=HCAPLUS ABB=ON L20 AND (CMP OR CHEM? (1A) MECH? (1A) POLI SH?) |
| L22 | 39 SEA FILE=HCAPLUS ABB=ON L20 AND SLURR? |
| L23 | 7 SEA FILE=HCAPLUS ABB=ON L22 AND POLISH? |
| L24 | 45 SEA FILE=HCAPLUS ABB=ON L13 OR L18 OR L21 OR L23 |
| L25 | 4 SEA FILE=REGISTRY ABB=ON L2 AND 1-2/N |
| L26 | 49123 SEA FILE=HCAPLUS ABB=ON L25 |

L27 193 SEA FILE=HCAPLUS ABB=ON (L20 OR L16) AND (L26 OR AMINE#/IT OR
(2ND OR SECOND OR TWO) (2A) SURFACT?)
L28 15 SEA FILE=HCAPLUS ABB=ON L27 AND SLURR?
L29 9 SEA FILE=HCAPLUS ABB=ON L28 AND (CMP OR POLISH?)
L30 49 SEA FILE=HCAPLUS ABB=ON L24 OR L29
L31 49 SEA FILE=HCAPLUS ABB=ON L30 AND (POLISH? OR CMP)
L32 15 SEA FILE=HCAPLUS ABB=ON L31 AND (COMPOSITION? OR COMPNS)
L34 14 SEA FILE=WPIX ABB=ON L29 OR L32

=> FILE COMPENDEX

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SEE HELP CLA >>>

=> D QUE L35

L2 10 SEA FILE=REGISTRY ABB=ON (106392-12-5/BI OR 12033-89-5/BI OR
121-44-8/BI OR 1310-58-3/BI OR 1336-21-6/BI OR 691397-13-4/BI
OR 7440-21-3/BI OR 75-50-3/BI OR 75-59-2/BI OR 7631-86-9/BI)
L3 1 SEA FILE=REGISTRY ABB=ON SILICA/CN
L4 2 SEA FILE=REGISTRY ABB=ON L2 AND PMS/CI
L6 709369 SEA FILE=HCAPLUS ABB=ON L3 OR SILICA OR SIO2 OR SILICON
?OXIDE
L11 2454 SEA FILE=HCAPLUS ABB=ON L6 AND NONION? (2A) SURFACT?
L12 44 SEA FILE=HCAPLUS ABB=ON L11 AND (CMP OR CHEM? (1A) MECH? (1A) POLI
SH?)
L13 21 SEA FILE=HCAPLUS ABB=ON L12 AND SLURR?
L15 65429 SEA FILE=HCAPLUS ABB=ON L4 OR ((PROPYLENE OXIDE OR PO) AND
(EO OR ETHYLENE OXIDE)) OR NONION? (2A) SURFACT?
L16 375 SEA FILE=HCAPLUS ABB=ON L15 AND ABRASIV?
L17 54 SEA FILE=HCAPLUS ABB=ON L16 AND SLURR?
L18 24 SEA FILE=HCAPLUS ABB=ON L17 AND (CMP OR CHEM? (1A) MECH? (1A) POLI
SH?)
L19 25030 SEA FILE=HCAPLUS ABB=ON L4 OR ((PROPYLENE OXIDE OR PO) AND
(EO OR ETHYLENE OXIDE))
L20 1607 SEA FILE=HCAPLUS ABB=ON L6 AND L19
L21 14 SEA FILE=HCAPLUS ABB=ON L20 AND (CMP OR CHEM? (1A) MECH? (1A) POLI
SH?)
L22 39 SEA FILE=HCAPLUS ABB=ON L20 AND SLURR?
L23 7 SEA FILE=HCAPLUS ABB=ON L22 AND POLISH?
L24 45 SEA FILE=HCAPLUS ABB=ON L13 OR L18 OR L21 OR L23
L25 4 SEA FILE=REGISTRY ABB=ON L2 AND 1-2/N
L26 49123 SEA FILE=HCAPLUS ABB=ON L25
L27 193 SEA FILE=HCAPLUS ABB=ON (L20 OR L16) AND (L26 OR AMINE#/IT OR
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L28 15 SEA FILE=HCAPLUS ABB=ON L27 AND SLURR?
L29 9 SEA FILE=HCAPLUS ABB=ON L28 AND (CMP OR POLISH?)
L30 49 SEA FILE=HCAPLUS ABB=ON L24 OR L29
L31 49 SEA FILE=HCAPLUS ABB=ON L30 AND (POLISH? OR CMP)
L32 15 SEA FILE=HCAPLUS ABB=ON L31 AND (COMPOSITION? OR COMPNS)

L35 1 SEA FILE=COMPENDEX ABB=ON L29 OR L32

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=> D QUE L36

| | | |
|-----|--------------------------------|--|
| L2 | 10 SEA FILE=REGISTRY ABB=ON | (106392-12-5/BI OR 12033-89-5/BI OR 121-44-8/BI OR 1310-58-3/BI OR 1336-21-6/BI OR 691397-13-4/BI OR 7440-21-3/BI OR 75-50-3/BI OR 75-59-2/BI OR 7631-86-9/BI) |
| L3 | 1 SEA FILE=REGISTRY ABB=ON | SILICA/CN |
| L4 | 2 SEA FILE=REGISTRY ABB=ON | L2 AND PMS/CI |
| L6 | 709369 SEA FILE=HCAPLUS ABB=ON | L3 OR SILICA OR SIO2 OR SILICON ?OXIDE |
| L11 | 2454 SEA FILE=HCAPLUS ABB=ON | L6 AND NONION? (2A) SURFACT? |
| L12 | 44 SEA FILE=HCAPLUS ABB=ON | L11 AND (CMP OR CHEM? (1A) MECH? (1A) POLI SH?) |
| L13 | 21 SEA FILE=HCAPLUS ABB=ON | L12 AND SLURR? |
| L15 | 65429 SEA FILE=HCAPLUS ABB=ON | L4 OR ((PROPYLENE OXIDE OR PO) AND (EO OR ETHYLENE OXIDE)) OR NONION? (2A) SURFACT? |
| L16 | 375 SEA FILE=HCAPLUS ABB=ON | L15 AND ABRASIV? |
| L17 | 54 SEA FILE=HCAPLUS ABB=ON | L16 AND SLURR? |
| L18 | 24 SEA FILE=HCAPLUS ABB=ON | L17 AND (CMP OR CHEM? (1A) MECH? (1A) POLI SH?) |
| L19 | 25030 SEA FILE=HCAPLUS ABB=ON | L4 OR ((PROPYLENE OXIDE OR PO) AND (EO OR ETHYLENE OXIDE)) |
| L20 | 1607 SEA FILE=HCAPLUS ABB=ON | L6 AND L19 |
| L21 | 14 SEA FILE=HCAPLUS ABB=ON | L20 AND (CMP OR CHEM? (1A) MECH? (1A) POLI SH?) |
| L22 | 39 SEA FILE=HCAPLUS ABB=ON | L20 AND SLURR? |
| L23 | 7 SEA FILE=HCAPLUS ABB=ON | L22 AND POLISH? |
| L24 | 45 SEA FILE=HCAPLUS ABB=ON | L13 OR L18 OR L21 OR L23 |
| L25 | 4 SEA FILE=REGISTRY ABB=ON | L2 AND 1-2/N |
| L26 | 49123 SEA FILE=HCAPLUS ABB=ON | L25 |
| L27 | 193 SEA FILE=HCAPLUS ABB=ON | (L20 OR L16) AND (L26 OR AMINE#/IT OR (2ND OR SECOND OR TWO) (2A) SURFACT?) |
| L28 | 15 SEA FILE=HCAPLUS ABB=ON | L27 AND SLURR? |
| L29 | 9 SEA FILE=HCAPLUS ABB=ON | L28 AND (CMP OR POLISH?) |
| L30 | 49 SEA FILE=HCAPLUS ABB=ON | L24 OR L29 |
| L31 | 49 SEA FILE=HCAPLUS ABB=ON | L30 AND (POLISH? OR CMP) |
| L32 | 15 SEA FILE=HCAPLUS ABB=ON | L31 AND (COMPOSITION? OR COMPNS) |
| L36 | 0 SEA FILE=JICST-EPLUS ABB=ON | L29 OR L32 |

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L3 1 SEA FILE=REGISTRY ABB=ON SILICA/CN

L4 2 SEA FILE=REGISTRY ABB=ON L2 AND PMS/CI

L6 709369 SEA FILE=HCAPLUS ABB=ON L3 OR SILICA OR SIO2 OR SILICON ?OXIDE

L11 2454 SEA FILE=HCAPLUS ABB=ON L6 AND NONION? (2A) SURFACT?

L12 44 SEA FILE=HCAPLUS ABB=ON L11 AND (CMP OR CHEM? (1A) MECH? (1A) POLI SH?)

L13 21 SEA FILE=HCAPLUS ABB=ON L12 AND SLURR?

L15 65429 SEA FILE=HCAPLUS ABB=ON L4 OR ((PROPYLENE OXIDE OR PO) AND (EO OR ETHYLENE OXIDE)) OR NONION? (2A) SURFACT?

L16 375 SEA FILE=HCAPLUS ABB=ON L15 AND ABRASIV?

L17 54 SEA FILE=HCAPLUS ABB=ON L16 AND SLURR?

L18 24 SEA FILE=HCAPLUS ABB=ON L17 AND (CMP OR CHEM? (1A) MECH? (1A) POLI SH?)

L19 25030 SEA FILE=HCAPLUS ABB=ON L4 OR ((PROPYLENE OXIDE OR PO) AND (EO OR ETHYLENE OXIDE))

L20 1607 SEA FILE=HCAPLUS ABB=ON L6 AND L19

L21 14 SEA FILE=HCAPLUS ABB=ON L20 AND (CMP OR CHEM? (1A) MECH? (1A) POLI SH?)

L22 39 SEA FILE=HCAPLUS ABB=ON L20 AND SLURR?

L23 7 SEA FILE=HCAPLUS ABB=ON L22 AND POLISH?

L24 45 SEA FILE=HCAPLUS ABB=ON L13 OR L18 OR L21 OR L23

L25 4 SEA FILE=REGISTRY ABB=ON L2 AND 1-2/N

L26 49123 SEA FILE=HCAPLUS ABB=ON L25

L27 193 SEA FILE=HCAPLUS ABB=ON (L20 OR L16) AND (L26 OR AMINE#/IT OR (2ND OR SECOND OR TWO) (2A) SURFACT?)

L28 15 SEA FILE=HCAPLUS ABB=ON L27 AND SLURR?

L29 9 SEA FILE=HCAPLUS ABB=ON L28 AND (CMP OR POLISH?)

L30 49 SEA FILE=HCAPLUS ABB=ON L24 OR L29

L31 49 SEA FILE=HCAPLUS ABB=ON L30 AND (POLISH? OR CMP)

L32 15 SEA FILE=HCAPLUS ABB=ON L31 AND (COMPOSITION? OR COMPNS)

L37 1 SEA FILE=INSPEC ABB=ON L29 OR L32

=> DUP REM L33 L34 L35 L37

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 PROCESSING COMPLETED FOR L34
 PROCESSING COMPLETED FOR L35
 PROCESSING COMPLETED FOR L37

L39

34 DUP REM L33 L34 L35 L37 (3 DUPLICATES REMOVED)

=>

=> D L39 ALL 1-34 HITSTR

L39 ANSWER 1 OF 34 HCAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 1
 AN 2005:527317 HCAPLUS
 DN 143:69836
 ED Entered STN: 19 Jun 2005
 TI Slurry compositions and CMP methods using
 the same
 IN Choi, Jaekwang; Lee, Jaedong; Hong, Chang-Ki
 PA S. Korea
 SO U.S. Pat. Appl. Publ., 17 pp.
 CODEN: USXXCO
 DT Patent
 LA English
 IC ICM H01L021-76
 ICS H01L021-302; H01L021-461
 INCL 438690000
 CC 76-3 (Electric Phenomena)
 Section cross-reference(s): 48, 66

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | US 2005130428 | A1 | 20050616 | US 2004-807139 | 20040324 |
| | JP 2005175498 | A2 | 20050630 | JP 2004-359039 | 20041210 |
| PRAI | KR 2003-90551 | A | 20031212 | | |
| | US 2004-807139 | A | 20040324 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|---------------|-------|---|
| US 2005130428 | ICM | H01L021-76 |
| | ICS | H01L021-302; H01L021-461 |
| | INCL | 438690000 |
| US 2005130428 | NCL | 438/690.000 |
| JP 2005175498 | FTERM | 3C058/AA07; 3C058/CB01; 3C058/CB10; 3C058/DA02; 3C058/DA12; 3C058/DA17 |

AB The exemplary embodiments of the present invention providing new slurry compns. suitable for use in processes involving the chemical mech. polishing (CMP) of a polysilicon layer. The slurry compns. include one or more nonionic polymeric surfactants that will selectively form a passivation layer on an exposed polysilicon surface to suppress the polysilicon removal rate relative to Si oxide and Si nitride and improve the planarity of the polished substrate. Exemplary surfactants include alkyl and aryl alcs. of ethylene oxide (EO) and propylene oxide (PO) block copolymers and may be present in the slurry compns. in an amount of up to .apprx.5%, although much smaller concns. may be effective. Other slurry additives may include viscosity modifiers, pH modifiers, dispersion agents, chelating agents, and amine or imine surfactants suitable for modifying the relative removal rates of Si nitride and Si oxide.

ST surfactant block copolymer CMP polysilicon semiconductor device fabrication

IT Polymers, uses

RL: TEM (Technical or engineered material use); USES (Uses)
 (block; slurry compns. and CMP methods to

applicant

suppress polysilicon removal)
 IT Polishing
 (chemical-mech.; slurry compns.
 and CMP methods to suppress polysilicon removal)
 IT pH
 (modifiers; slurry compns. and CMP
 methods to suppress polysilicon removal)
 IT Surfactants
 (nonionic; slurry compns. and CMP
 methods to suppress polysilicon removal)
 IT Abrasives
 Chelating agents
 Dispersing agents
 Passivation
 Semiconductor device fabrication
 Slurries
 Viscosity
 (slurry compns. and CMP methods to
 suppress polysilicon removal)
 IT Amines, uses
 Imines
 RL: TEM (Technical or engineered material use); USES (Uses)
 (slurry compns. and CMP methods to
 suppress polysilicon removal)
 IT 7440-21-3, Polysilicon, processes 7631-86-9, Silica,
 processes 12033-89-5, Silicon nitride, processes
 RL: PEP (Physical, engineering or chemical process); PYP (Physical
 process); TEM (Technical or engineered material use); PROC (Process); USES
 (Uses)
 (slurry compns. and CMP methods to
 suppress polysilicon removal)
 IT 75-50-3, Trimethylamine, uses 75-59-2,
 Tetramethylammonium hydroxide 121-44-8, Triethylamine, uses
 1310-58-3, Potassium hydroxide (K(OH)), uses 1336-21-6, Ammonium
 hydroxide 106392-12-5, Ethylene oxide-
 propylene oxide block copolymer 106392-12-5D,
 Ethylene oxide-propylene oxide block
 copolymer, monononylphenyl and monoocetylphenyl ethers 691397-13-4
 , Ethylene oxide-propylene oxide
 triblock copolymer
 RL: TEM (Technical or engineered material use); USES (Uses)
 (slurry compns. and CMP methods to
 suppress polysilicon removal)
 IT 7631-86-9, Silica, processes
 RL: PEP (Physical, engineering or chemical process); PYP (Physical
 process); TEM (Technical or engineered material use); PROC (Process); USES
 (Uses)
 (slurry compns. and CMP methods to
 suppress polysilicon removal)
 RN 7631-86-9 HCPLUS
 CN Silica (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

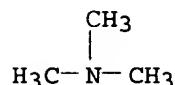
O=Si=O

IT 75-50-3, Trimethylamine, uses 75-59-2,
 Tetramethylammonium hydroxide 121-44-8, Triethylamine, uses
 1336-21-6, Ammonium hydroxide 106392-12-5,
 Ethylene oxide-propylene oxide block

copolymer 106392-12-5D, Ethylene oxide-propylene oxide block copolymer, monononylphenyl and monoocetylphenyl ethers 691397-13-4, Ethylene oxide-propylene oxide triblock copolymer
 RL: TEM (Technical or engineered material use); USES (Uses)
 (slurry compns. and CMP methods to suppress polysilicon removal)

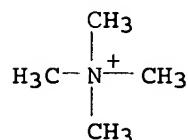
RN 75-50-3 HCPLUS

CN Methanamine, N,N-dimethyl- (9CI) (CA INDEX NAME)



RN 75-59-2 HCPLUS

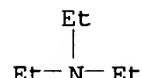
CN Methanaminium, N,N,N-trimethyl-, hydroxide (9CI) (CA INDEX NAME)



● OH⁻

RN 121-44-8 HCPLUS

CN Ethanamine, N,N-diethyl- (9CI) (CA INDEX NAME)



RN 1336-21-6 HCPLUS

CN Ammonium hydroxide ((NH₄)(OH)) (9CI) (CA INDEX NAME)

H₄N-OH

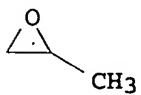
RN 106392-12-5 HCPLUS

CN Oxirane, methyl-, polymer with oxirane, block (9CI) (CA INDEX NAME)

CM 1

CRN 75-56-9

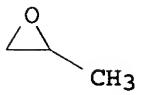
CMF C₃ H₆ O



CM 2

CRN 75-21-8
CMF C2 H4 ORN 106392-12-5 HCPLUS
CN Oxirane, methyl-, polymer with oxirane, block (9CI) (CA INDEX NAME)

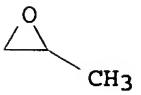
CM 1

CRN 75-56-9
CMF C3 H6 O

CM 2

CRN 75-21-8
CMF C2 H4 ORN 691397-13-4 HCPLUS
CN Oxirane, methyl-, polymer with oxirane, triblock (9CI) (CA INDEX NAME)

CM 1

CRN 75-56-9
CMF C3 H6 O

CM 2

CRN 75-21-8

CMF C2 H4 O

O

L39 ANSWER 2 OF 34 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2005:823155 HCAPLUS
 ED Entered STN: 19 Aug 2005
 TI Synergistic antibacterial formulation containing cefixime trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores
 IN Khandelwal, Sanjeev
 PA India
 SO U.S. Pat. Appl. Publ., 25 pp.
 CODEN: USXXCO
 DT Patent
 LA English
 IC ICM A61K031-545
 ICS A61K031-47; A61K031-43; A61K031-716
 INCL 424470000; 514192000; 514057000; 514200000
 CC 63-6 (Pharmaceuticals)
 Section cross-reference(s): 1

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---|------|----------|-----------------|----------|
| PI | US 2005181051 | A1 | 20050818 | US 2004-13110 | 20041215 |
| | EP 1566176 | A1 | 20050824 | EP 2005-250879 | 20050216 |
| | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU | | | | |
| PRAI | IN 2004-MU178 | A | 20040216 | | |
| | IN 2004-MU258 | A | 20040303 | | |

CLASS

| | PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|----|--|-------|--|
| AB | US 20050181051 | ICM | A61K031-545 |
| | | ICS | A61K031-47; A61K031-43; A61K031-716 |
| | | INCL | 424470000; 514192000; 514057000; 514200000 |
| | US 2005181051 | NCL | 424/470.000; 514/192.000; 514/057.000; 514/200.000 |
| | A synergistic antibacterial formulation for oral delivery of cefixime trihydrate, cloxacillin sodium in an extended release form and an immediate release form, and Lactobacillus sporogenes spores is provided. For example, sustained-release granules were prepared by wet granulation of cloxacillin sodium 50.0 kg and hydroxypropyl Me cellulose (HPMC; average viscosity 4000 cps) 6.0 kg, using a binder comprising HPMC (average viscosity 50 cps) 800g dissolved in a mixture of dichloromethane 8.0 kg and iso-Pr alc. 12.0 kg. The core was prepared by blending cloxacillin sodium sustained-release granules obtained with a mixture of cloxacillin sodium particle 7.6 kg, cefixime trihydrate particles 11.2 kg, L. sporogenes spores 750 g, sodium starch glycollate 1.0 kg, colloidal silicon dioxide 0.3 kg, sodium lauryl sulfate 1.0 kg and talc 1.0 kg was prepared. Magnesium stearate 1.0 kg was added and further blendded, resulting in the lubricated core mass. This core mass was then compressed into cores of average weight of 806.2 mg <plus/minus>3%. The core obtained were pan coated with a film coating composition containing Et cellulose 0.8 kg, hydroxypropyl cellulose 0.8 kg, iso-Pr alc. 12 kg, methylene chloride 22 kg, di-Et phthalate 0.01 kg and titanium dioxide 0.15 kg in a stainless steel container and stirred for five minutes using overhead stirrer until | | |

a smooth slurry was obtained. The coated tablets were polished with talc. The film-coated tablet (average weight 820 mg <plus/minus>3%) contained (i) cloxacillin sodium equivalent to 250 mg cloxacillin sustained release, (ii) cloxacillin sodium equivalent to 250 mg cloxacillin immediate release, (III) cefixime trihydrate equivalent to 100 mg cefixime immediate release, and (IV) L. sporogenes 45 million spores.

ST cloxacillin cefixime Lactobacillus coated tablet synergistic antibacterial

IT Fatty acids
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(C6-30; synergistic antibacterial formulation containing cefixime trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)

IT Alcohols
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(C16-18, ethoxylated; synergistic antibacterial formulation containing cefixime trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)

IT Alcohols

Glycerides
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(C16-18; synergistic antibacterial formulation containing cefixime trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)

IT Gums and Mucilages
(Panwar gum, larch arabolactan; synergistic antibacterial formulation containing cefixime trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)

IT Drug delivery systems
(controlled-release; synergistic antibacterial formulation containing cefixime trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)

IT Monoglycerides
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(diacetylated; synergistic antibacterial formulation containing cefixime trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)

IT Alcohols
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(fatty, C6-30; synergistic antibacterial formulation containing cefixime trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)

IT Lipids
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(glycerolipids; synergistic antibacterial formulation containing cefixime trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)

IT Citrus
(pulp; synergistic antibacterial formulation containing cefixime trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)

IT Aerogels
(silica; synergistic antibacterial formulation containing cefixime trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)

IT Waxes
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(spermaceti; synergistic antibacterial formulation containing cefixime trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)

IT Acacia

Antibacterial agents

Antibiotics

Bacillus coagulans

Beeswax

Cation exchangers

Chondrus crispus

Combination chemotherapy

Human
 Molasses
 Porifera
 Surfactants
 (synergistic antibacterial formulation containing cefixime trihydrate,
 cloxacillin sodium and Lactobacillus sporogenes spores)
 IT Alcohols
 Carnauba wax
 Ceramides
 Cottonseed oil
 Flavonoids
 Gelatins
 Glycerides
 Polyamides
 Polyoxyalkylenes
 Polysiloxanes
 Rosin
 Silica gel
 Smectite-group minerals
 Soybean oil
 Sphingolipids
 Sphingosines
 Waxes
 RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
 (synergistic antibacterial formulation containing cefixime trihydrate,
 cloxacillin sodium and Lactobacillus sporogenes spores)
 IT Drug interactions
 (synergistic; synergistic antibacterial formulation containing cefixime
 trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)
 IT Drug delivery systems
 (tablets, coated; synergistic antibacterial formulation containing cefixime
 trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)
 IT 9003-39-8D, crosslinked
 RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
 (Crospovidone; synergistic antibacterial formulation containing cefixime
 trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)
 IT 7631-86-9, Colloidal silicon dioxide
 RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
 (colloidal; synergistic antibacterial formulation containing cefixime
 trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)
 IT 642-78-4, Cloxacillin Sodium 125110-14-7, Cefixime Trihydrate
 RL: ADV (Adverse effect, including toxicity); PAC (Pharmacological
 activity); PKT (Pharmacokinetics); THU (Therapeutic use); BIOL (Biological
 study); USES (Uses)
 (synergistic antibacterial formulation containing cefixime trihydrate,
 cloxacillin sodium and Lactobacillus sporogenes spores)
 IT 9004-65-3, Hydroxypropyl methylcellulose
 RL: PRP (Properties); THU (Therapeutic use); BIOL (Biological study); USES
 (Uses)
 (synergistic antibacterial formulation containing cefixime trihydrate,
 cloxacillin sodium and Lactobacillus sporogenes spores)
 IT 50-70-4D, Sorbitol, derivs. 50-99-7, Glucose 56-81-5D, Glycerol,
 derivs. 57-10-3, Palmitic Acid 57-11-4, Stearic acid 57-50-1,
 Sucrose 57-50-1D, Sucrose, esters 57-88-5, Cholesterol 63-42-3,
 Lactose 67-68-5, Dimethyl sulfoxide 69-65-8D, Mannitol, derivs.
 71-41-0, Pentanol 106-11-6, Diethylene glycol monostearate 107-21-1D,
 1,2-Ethanediol, derivs. 110-54-3, Hexane 111-03-5, Glyceryl monooleate
 111-27-3, Hexanol 111-60-4, Ethylene glycol monostearate 112-92-5,
 Stearyl Alcohol 117-39-5, Quercetin 151-21-3; Sodium lauryl sulfate
 446-72-0, Genistein 480-40-0, Chrysin 480-44-4, Acacetin 520-27-4,

Diosmin 538-24-9D, Glyceryl trilaurate, glyceryl ester 546-93-0,
 Magnesium carbonate 555-45-3D, Glyceryl trimyristate, glyceryl ester
 557-04-0, Magnesium stearate 557-05-1, Zinc stearate 1309-48-4,
 Magnesium oxide 1323-39-3, Propylene glycol monostearate 1338-39-2,
 Sorbitan monolaurate 1338-41-6, Sorbitan monostearate 1338-43-8,
 Sorbitan monooleate 1344-95-2, Calcium silicate 1592-23-0, Calcium
 stearate 3097-08-3, Magnesium lauryl sulfate 7757-93-9, Dibasic
 calcium phosphate 7758-87-4, Tribasic calcium phosphate 8007-43-0,
 Sorbitan sesquioleate 9000-01-5, Gum arabic 9000-28-6, Ghatti gum
 9000-30-0, Guar gum 9002-18-0, Agar 9002-89-5, Polyvinyl alcohol
 9002-92-0, Lauromacrogol 9003-20-7, Polyvinyl acetate 9003-39-8,
 Polyvinylpyrrolidone 9004-32-4, Carboxymethylcellulose sodium
 9004-34-6, Cellulose 9004-38-0, Cellulose acetate phthalate 9004-53-9,
 Dextrin 9004-57-3, Ethylcellulose 9004-64-2, Hydroxypropylcellulose
 9004-67-5, Methylcellulose 9004-99-3, PEG Stearate 9005-25-8, Starch
 9005-38-3, Sodium alginate 9005-64-5, polysorbate 20 9005-65-6,
 polysorbate 80 9005-66-7, polysorbate 40 9005-67-8, polysorbate 60
 9005-70-3, polysorbate 85 9005-71-4, polysorbate 65 9011-14-7,
 Polymethyl methacrylate 9036-19-5 9036-66-2, Arabinogalactan
 9050-04-8 9057-02-7, Pullulan 9057-06-1, Carboxymethyl starch
 9063-38-1, Sodium starch glycolate 10236-47-2, Naringin 11099-07-3D,
 Glyceryl stearate, glyceryl ester 12619-70-4, Cyclodextrin 14807-96-6,
 Talc 14987-04-3, Magnesium trisilicate 25087-26-7, Polymethacrylic
 acid 25301-02-4, Tyloxapol 25322-68-3, Polyethylene glycol
 25322-68-3D, Macrogol, ethers and esters 25618-55-7D, Polyglycerol,
 derivs. 26027-38-3, Nonoxynol 26266-57-9, Sorbitan monopalmitate
 26266-58-0, Sorbitan trioleate 26338-57-8, Maleic anhydride-vinyl
 alcohol copolymer 26658-19-5, Sorbitan tristearate 31566-31-1,
 Glyceryl monostearate 37353-59-6, Hydroxymethyl cellulose 54182-62-6,
 Polacrilin 58858-21-2, Hydroxypropyl methylcellulose acetate
 69670-80-0, Hydroxymethyl propylcellulose 74811-65-7, Croscarmellose
 sodium 86157-80-4 106392-12-5, Poloxamer 222414-51-9,
 Polyethylene glycol hydroxystearate

RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
 (synergistic antibacterial formulation containing cefixime trihydrate,
 cloxacillin sodium and Lactobacillus sporogenes spores)

IT 7631-86-9, Colloidal silicon dioxide

RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
 (colloidal; synergistic antibacterial formulation containing cefixime
 trihydrate, cloxacillin sodium and Lactobacillus sporogenes spores)

RN 7631-86-9 HCPLUS

CN Silica (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

IT 106392-12-5, Poloxamer

RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
 (synergistic antibacterial formulation containing cefixime trihydrate,
 cloxacillin sodium and Lactobacillus sporogenes spores)

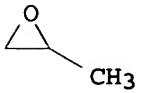
RN 106392-12-5 HCPLUS

CN Oxirane, methyl-, polymer with oxirane, block (9CI) (CA INDEX NAME)

CM 1

CRN 75-56-9

CMF C3 H6 O



CM 2

CRN 75-21-8
CMF C2 H4 O

L39 ANSWER 3 OF 34 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2005-416664 [42] WPIX
 DNN N2005-338024 DNC C2005-127515
 TI Slurry useful for chemical mechanical polishing in e.g. manufacturing semiconductor device comprises a copper oxidizing agent; a complexing agent; a surfactant; an inorganic particle; and resin particle containing polystyrene.
 DC A97 E19 G04 L02 L03 P61 U11
 IN FUKUSHIMA, D; MINAMIHABA, G; YAMAMOTO, S; YANO, H
 PA (TOKE) TOSHIBA KK; (FUKU-I) FUKUSHIMA D; (MINA-I) MINAMIHABA G; (YAMA-I) YAMAMOTO S; (YANO-I) YANO H
 CYC 2
 PI US 2005118821 A1 20050602 (200542)* 14 H01L021-302
 JP 2005159166 A 20050616 (200542) 19 H01L021-304
 ADT US 2005118821 A1 US 2004-932096 20040902; JP 2005159166 A JP 2003-398163 20031127
 PRAI JP 2003-398163 20031127
 IC ICM H01L021-302; H01L021-304
 ICS B24B037-00; C09K003-14; H01L021-461
 AB US2005118821 A UPAB: 20050704
 NOVELTY - A chemical mechanical polishing (CMP) slurry comprises a copper oxidizing agent; a complexing agent forming a copper organic complex; a surfactant; an inorganic particle; and a resin particle (R1) containing polystyrene. (R1) Has a functional group of same kind of polarity as that of the inorganic particle, an average particle diameter of less than 100 nm, and is incorporated at a concentration of less than 1 weight%.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(1) polishing of a semiconductor involving contacting a polishing surface of the semiconductor substrate with a polishing pad attached to a turntable, and dropping the CMP slurry on the polishing pad to polish the polishing surface; and

(2) manufacturing a semiconductor device involving forming an insulating film above a semiconductor substrate, forming a recessed portion in the insulating film, depositing a conductive material inside the recessed portion and above the insulating film to form a conductive layer, and removing the conductive material which is deposited above the insulating film by CMP using a CMP slurry to selectively leave the conductive material in the recessed portion.

USE - For chemical mechanical polishing (CMP) of a copper film formed on a surface of a semiconductor

substrate having an over-plating portion, by removing the residual copper in the region of over-plating to form a copper film of uniform thickness, in the manufacture of a semiconductor device.

ADVANTAGE - By using the **CMP slurry** composition the polishing can be performed at high polishing rate while suppressing the generation of erosion or dishing.

Dwg.0/6

FS CPI EPI GMPI
 FA AB; DCN
 MC CPI: A04-C02E; A12-A03; E06-D01; E06-D02; E06-D08; E07-D04C; E10-A09B4; E10-B02D6; E10-C02D1; E10-C02D2; E10-E04M3; E31-E01; E31-E03; E31-P03; E34-C02; E35-K02; G04-B04; L02-F; L02-J; L04-C27
 EPI: U11-A10; U11-C06A1A

L39 ANSWER 4 OF 34 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2005-402873 [41] WPIX
 DNN N2005-326740 DNC C2005-124404
 TI Manufacture of semiconductor device, e.g. memory, comprises chemical mechanical polishing spin-on glass film on silicon dioxide film using slurry containing cerium oxide and cationic surfactant.

DC L03 U11
 IN MATSUI, Y; MINAMIHABA, G; SHIGETA, A; YANO, H
 PA (TOKE) TOSHIBA KK; (MATS-I) MATSUI Y; (MINA-I) MINAMIHABA G; (SHIG-I) SHIGETA A; (YANO-I) YANO H
 CYC 3

PI US 2005106874 A1 20050519 (200541)* 26 H01L021-302
 JP 2005109452 A 20050421 (200541) 21 H01L021-304
 KR 2005027157 A 20050317 (200557) H01L021-304
 ADT US 2005106874 A1 US 2004-935429 20040908; JP 2005109452 A JP 2004-258030 20040906; KR 2005027157 A KR 2004-72936 20040913

PRAI JP 2004-258030 20040906; JP 2003-321474 20030912
 IC ICM H01L021-302; H01L021-304
 ICS H01L021-461

AB US2005106874 A UPAB: 20050629
 NOVELTY - Manufacturing a semiconductor device comprises depositing a silicon dioxide film (3) on a substrate (1) having a wiring pattern (2); coating a spin-on glass (SOG) film (4) on the silicon dioxide film; and polishing the spin-on glass film using slurry containing cerium oxide and cationic surfactant with a chemical-mechanical polishing process.

DETAILED DESCRIPTION - A further INDEPENDENT CLAIM is included for manufacture of a semiconductor device.

USE - For manufacturing a semiconductor device e.g. memory, high speed logic large scale integrated circuit (LSI), system LSI or memory/logic mixed LSI.

ADVANTAGE - The planarization step executed with the chemical-mechanical polishing process that uses the slurry containing cerium oxide and cationic surfactant(s) selectively polishes SiO₂ film and SOG film with the polishing selectivity value of at least 5. The reliability of the semiconductor device can be enhanced through the enhancement of the insulating capability of the semiconductor device.

DESCRIPTION OF DRAWING(S) - The figure shows a section of a semiconductor device during processing.

Substrate 1

Wiring pattern 2

Silicon dioxide film 3

SOG film 4
 Dwg.3B/16
 FS CPI EPI
 FA AB; GI
 MC CPI: L04-B04A; L04-C12; L04-C12D; L04-C27; L04-E15
 EPI: U11-C06A1A; U11-C18B5

L39 ANSWER 5 OF 34 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2005-354123 [36] WPIX
 DNN N2005-289162 DNC C2005-109369
 TI **Slurry useful for chemical mechanical polishing**
 of copper and barrier films comprises at least one abrasive, at least one organic phosphonate, at least one oxidizer and water.
 DC A97 E11 L02 L03 U11
 IN JENG, W; TSENG, S; YANG, K
 PA (JENG-I) JENG W; (TSEN-I) TSENG S; (YANG-I) YANG K
 CYC 1
 PI US 2005090104 A1 20050428 (200536)* 12 H01L021-302
 ADT US 2005090104 A1 Provisional US 2003-514830P 20031027, US 2004-958417
 20041006
 PRAI US 2003-514830P 20031027; US 2004-958417 20041006
 IC ICM H01L021-302
 ICS H01L021-461
 AB US2005090104 A UPAB: 20050608
 NOVELTY - A **chemical mechanical polishing** slurry comprises at least one abrasive, at least one organic phosphonate, at least one oxidizer and water.
 USE - For **chemical mechanical polishing** of copper and barrier films (claimed).

ADVANTAGE - The **slurry** is capable of **polishing** copper at high removal rate at a relatively low down force so that **CMP** throughput is improved and **CMP** defects are reduced, has high selectivity to tantalum barrier. The barrier **slurry** delivers good planarity, has high hydrogen peroxide stability so that **slurry** pot lifetime is extended and the performance of **chemical mechanical polishing** process is stable. The **slurry** gives low dishing and erosion so that the interconnect metal lines have uniform sheet resistance and the wafer surface planarity is good for fabrication multi-level interconnects. The **slurry** provides smooth copper surface on the **polished** surface, gives low copper corrosion defects on **polished** wafers, is cost effective. The organic phosphonates are excellent chelating agents for copper. The phosphonates generally have significantly higher solubility in water comparing to many carboxylic and amino acids or salts given in the prior art for copper **chemical mechanical polishing**. The manufacturing process of **slurry** is usually simpler and more cost effective.

Dwg.0/5

FS CPI EPI
 FA AB; DCN
 MC CPI: A12-W12B; E05-G02; E05-G03D; E31-C; E31-E01; E31-E03; E31-P03;
 E34-C02; E34-E; E35-K02; E35-S; E35-U05; L02-F04; L04-B04A; L04-C27
 EPI: U11-A10; U11-C06A1A

L39 ANSWER 6 OF 34 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2005-151610 [16] WPIX
 CR 2005-519376 [53]
 DNN N2005-127934 DNC C2005-048924
 TI **Chemical mechanical polishing slurry**

for removing silicon dioxide in preference to silicon nitride useful in manufacture of semiconductor wafer, comprises selectivity enhancer comprising nucleic acid related compound e.g. uridine.

DC A85 B04 D16 P61 U11
 IN HEGDE, S; XU, W; XU, W P
 PA (HEGD-I) HEGDE S; (XUWW-I) XU W; (NYAC-N) NYACOL NANO TECHNOLOGIES INC
 CYC 108
 PI US 2005028450 A1 20050210 (200516)* 6 B24D003-02
 WO 2005014746 A1 20050217 (200516) EN C09G001-02
 RW: AT BE BG BW CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE IT KE
 LS LU MC MW MZ NA NL OA PL PT RO SD SE SI SK SL SZ TR TZ UG ZM ZW
 W: AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE
 DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG
 KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ
 OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG
 US UZ VC VN YU ZA ZM ZW
 ADT US 2005028450 A1 US 2003-635949 20030807; WO 2005014746 A1 WO 2004-US25536
 20040806
 PRAI US 2003-635949 20030807
 IC ICM B24D003-02; C09G001-02
 ICS C09K003-14; H01L021-304; H01L021-306
 AB US2005028450 A UPAB: 20050818
 NOVELTY - A chemical mechanical polishing (CMP) slurry comprises a liquid, abrasive particles and a selectivity enhancer comprising a nucleic acid related compound.
 DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a CMP polishing process for selectively removing silicon dioxide from the surface of workpiece containing surface areas of silicon dioxide and surface areas of silicon nitride in which the surface to be polished is contacted with a polishing pad and a CMP slurry is applied to the interface between the polishing pad the surface to be polished.
 USE - The slurry is used for selectively removing silicon dioxide from the surface of a work-piece containing surface areas of silicon dioxide and surface areas of silicon nitride. It is useful in the manufacture of semiconductor wafers and chips.
 ADVANTAGE - The slurry exhibits high selectivities for removing silicon dioxide in preference to silicon nitride.
 Dwg.0/0
 FS CPI EPI GMPI
 FA AB; DCN
 MC CPI: A12-A03; A12-E07C; B04-B03A; B04-B03B; B04-B03D; B04-B03E; B04-C03;
 B04-E01; B05-B02C; B06-D09; B07-D04A; B07-D12; B10-A22; B10-B04B;
 D05-H10; D05-H13
 EPI: U11-A10; U11-C06A1A
 L39 ANSWER 7 OF 34 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2005-120520 [13] WPIX
 CR 2004-641155 [62]
 DNN N2005-103959 DNC C2005-040088
 TI Chemical mechanical polishing slurry
 used in forming damascene wiring used for manufacturing semiconductor device, comprises solvent, abrasive grains, and silicone-based surfactant having specific hydrophilic lipophilic balance value.
 DC A97 G04 L03 U11

IN MATSUI, Y; MINAMIHABA, G; YANO, H
 PA (TOKE) TOSHIBA KK

CYC 1

PI US 2005009322 A1 20050113 (200513)* 15 H01L021-4763

ADT US 2005009322 A1 Div ex US 2003-706052 20031113, US 2004-909287 20040803

FDT US 2005009322 A1 Div ex US 6794285

PRAI JP 2003-37179 20030214

IC ICM H01L021-4763

ICS H01L021-302; H01L021-461

AB US2005009322 A UPAB: 20050224

NOVELTY - A chemical mechanical polishing (CMP) slurry comprises a solvent, abrasive grains, and silicone-based surfactant having an hydrophilic lipophilic balance (HLB) value of 7-20.

USE - The CMP slurry is used in the formation of damascene wiring used for mounting a high-speed logic large scale integrated circuit (LSI), system LSI and memory/logic hybrid LSI. It is used in the manufacture of semiconductor device.

ADVANTAGE - The slurry allows the formation of damascene wiring, where the density of defects and the concentration of surface impurities can be minimized.

DESCRIPTION OF DRAWING(S) - The figure shows a cross-sectional view of a method of manufacturing a semiconductor device.

Plug 102

Laminated insulating films 103, 104

Barrier metal film 105

Wiring material film 106

Dwg.6A/6

FS CPI EPI

FA AB; GI

MC CPI: A05-H01B; A06-A00E; A12-A03; A12-W12C; G04-B04; L04-C13B; L04-C27

EPI: U11-A10; U11-C05D2; U11-C06A1A

L39 ANSWER 8 OF 34 HCPLUS COPYRIGHT 2005 ACS on STN

AN 2004:392243 HCPLUS

DN 140:398393

ED Entered STN: 14 May 2004

TI Chemical mechanical polishing
composition and method

IN Li, Yuzhou; Keleher, Jason; Zhao, Junzi; Brancewicz, Chris

PA Sachem, Inc., USA

SO U.S. Pat. Appl. Publ., 31 pp.

CODEN: USXXCO

DT Patent

LA English

IC ICM C09K003-14

ICS H01L021-302; H01L021-461

INCL 438689000

CC 76-3 (Electric Phenomena)

FAN.CNT 1

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------------|------|----------|-----------------|----------|
| PI US 2004092102 | A1 | 20040513 | US 2002-292404 | 20021112 |
| PRAI US 2002-292404 | | | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|---------------|------------------------------|------------------------------------|
| US 2004092102 | ICM C09K003-14 | |
| | ICS H01L021-302; H01L021-461 | |
| | INCL 438689000 | |

US 2004092102 NCL 438/689.000
ECLA C09G001/04; H01L021/321P2

AB A chemical-mech. polishing (CMP) formulation and method for using the same. The composition is useful for polishing semiconductor substrates, and particularly substrate surfaces containing copper, tungsten, or alloys of the same. The CMP formulation may contain a copolymer enhancement agent such as a Pluronics compound (e.g., Pluronic P103, Pluronic P123, Pluronic F108, Pluronic F88, etc.), and/or a vesicle encapsulating agent, as well as an active agent that is chemical reactive with the substrate to enhance polishing performance. The active agent may be a bifunctional compound that is capable of functioning as both a passivating agent and a complexing agent to achieve an optimum rate of passivation and oxidation on the substrate surface. An active agent can also take the form of an oxidation activator, such as a metal ion, encapsulated in a vesicle or micelle, that is released with applied pressure to accelerate the removal process and improve planarization efficiency.

ST chem mech polishing compn process

IT Abrasives

Diodes

Hydrotropes

Integrated circuits

Interconnections, electric

Oxidizing agents

Transistors

(chemical-mech. polishing composition
and polishing method using same)

IT Amines, uses

Phospholipids, uses

RL: NUU (Other use, unclassified); USES (Uses)
(chemical-mech. polishing composition
and polishing method using same)

IT Polishing

(chemical-mech.; chemical-mech.
polishing composition and polishing method using
same)

IT Solvents

(cosolvents; chemical-mech. polishing
composition and polishing method using same)

IT Acids, uses

RL: NUU (Other use, unclassified); USES (Uses)
(inorg.; chemical-mech. polishing
composition and polishing method using same)

IT Surfactants

(nonionic; chemical-mech. polishing
composition and polishing method using same)

IT Acids, uses

RL: NUU (Other use, unclassified); USES (Uses)
(organic; chemical-mech. polishing
composition and polishing method using same)

IT Sulfonic acids, uses

RL: NUU (Other use, unclassified); USES (Uses)
(salts, aryl; chemical-mech. polishing
composition and polishing method using same)

IT Semiconductor materials

(substrate; chemical-mech. polishing
composition and polishing method using same)

IT Copper alloy, base

Tungsten alloy, base

RL: DEV (Device component use); PEP (Physical, engineering or chemical

process); PYP (Physical process); PROC (Process); USES (Uses)
 (chemical-mech. polishing composition
 and polishing method using same)

IT 1306-38-3, Ceria, uses 1309-48-4, Magnesia, uses 1314-23-4, Zirconia,
 uses 1344-28-1, Alumina, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (abrasive; chemical-mech. polishing
 composition and polishing method using same)

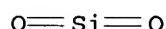
IT 7429-90-5, Aluminum, processes 7440-25-7, Tantalum, processes
 7440-32-6, Titanium, processes 7440-33-7, Tungsten, processes
 7440-50-8, Copper, processes
 RL: DEV (Device component use); PEP (Physical, engineering or chemical
 process); PYP (Physical process); PROC (Process); USES (Uses)
 (chemical-mech. polishing composition
 and polishing method using same)

IT 51-17-2, Benzimidazole 56-40-6, Glycine, uses 64-18-6, Formic acid,
 uses 64-19-7, Acetic acid, uses 67-63-0, 2-Propanol, uses 79-09-4,
 Propanoic acid, uses 107-21-1, Ethylene glycol, uses 112-60-7,
 Tetraethylene glycol 144-62-7, Oxalic acid, uses 147-85-3, Proline,
 uses 288-32-4D, Imidazole, derivative 1300-72-7, Sodium xylenesulfonate
 1310-73-2, Sodium hydroxide, uses 7631-86-9, Silicon
 oxide, uses 7647-01-0, Hydrochloric acid, uses 7664-41-7,
 Ammonia, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid,
 uses 7732-18-5, Water, uses 10034-85-2, Hydrogen iodide
 106392-12-5, Pluronic P103 203945-07-7, SiLK (dielectric)
 RL: NUU (Other use, unclassified); USES (Uses)
 (chemical-mech. polishing composition
 and polishing method using same)

IT 7722-84-1, Hydrogen peroxide, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (chemical-mech. polishing composition
 and polishing method using same)

IT 7631-86-9, Silicon oxide, uses
 106392-12-5, Pluronic P103
 RL: NUU (Other use, unclassified); USES (Uses)
 (chemical-mech. polishing composition
 and polishing method using same)

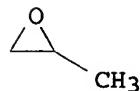
RN 7631-86-9 HCPLUS
 CN Silica (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 106392-12-5 HCPLUS
 CN Oxirane, methyl-, polymer with oxirane, block (9CI) (CA INDEX NAME)

CM 1

CRN 75-56-9
 CMF C3 H6 O



CM 2

CRN 75-21-8
 CMF C2 H4 O

O

L39 ANSWER 9 OF 34 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:759257 HCAPLUS
 DN 141:252819
 ED Entered STN: 17 Sep 2004
 TI Aluminum or glass substrates for magnetic hard disks, their manufacture, and polishing slurries
 IN Horie, Yuji; Okuyama, Hiromitsu; Tanifuji, Tatsuya
 PA Nippon Micro Coating Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 16 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM G11B005-73
 ICS B24B021-00; B24B037-00; C09K003-14; G11B005-84
 CC 77-8 (Magnetic Phenomena)
 Section cross-reference(s): 57

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---------------|------|----------|-----------------|----------|
| PI | JP 2004259417 | A2 | 20040916 | JP 2003-92680 | 20030224 |
| | US 2004241379 | A1 | 20041202 | US 2004-776372 | 20040210 |
| PRAI | JP 2003-92680 | A | 20030224 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|------------|-------|------------------------------------|
|------------|-------|------------------------------------|

| | | |
|---------------|-------|--|
| JP 2004259417 | ICM | G11B005-73 |
| | ICS | B24B021-00; B24B037-00; C09K003-14; G11B005-84 |
| JP 2004259417 | FTERM | 3C058/AA05; 3C058/AA07; 3C058/AA09; 3C058/AC04; 3C058/CB01; 3C058/CB03; 3C058/DA17; 5D006/CB04; 5D006/CB07; 5D006/DA03; 5D006/EA04; 5D112/AA02; 5D112/AA24; 5D112/BA06; 5D112/GA09; 5D112/GA13; 5D112/GA14 |

| | | |
|---------------|------|--------------------------|
| US 2004241379 | NCL | 428/848.200 |
| | ECLA | G11B005/73N; G11B005/84B |

AB The substrates are equipped with textured streaks of 70 lines/ μ m in the radius direction. Method for manufacture of the substrates includes polishing the substrates by pressing a running polishing tape towards the substrates that are rotating in the opposite direction, under feeding a polishing slurry. The polishing slurry contains single crystal diamond particles, polycryst. diamond particles, or their clusters having diameter 1-50 nm as abrasive grains and water or water-based solution as dispersants. The said polishing slurries containing clusters of the single crystal and/or polycryst. diamond particles are also claimed.

ST aluminum substrate polishing magnetic hard disk; glass substrate streaked surface hard disk; diamond cluster particle abrasive polishing slurry

IT Surfactants
 (anionic, slurry dispersant; manufacture of Al (alloy) or glass

substrates with grooved surfaces for magnetic hard disks, by
polishing with diamond cluster abrasive
slurries)

IT Clusters

(diamond particle; manufacture of Al (alloy) or glass substrates with
grooved surfaces for magnetic hard disks, by polishing with
diamond cluster abrasive slurries)

IT Amides, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(fatty, slurry dispersant; manufacture of Al (alloy) or glass
substrates with grooved surfaces for magnetic hard disks, by
polishing with diamond cluster abrasive
slurries)

IT Surface structure

(grooved; manufacture of Al (alloy) or glass substrates with grooved
surfaces for magnetic hard disks, by polishing with diamond
cluster abrasive slurries)

IT Magnetic disks

(hard; manufacture of Al (alloy) or glass substrates with grooved surfaces
for magnetic hard disks, by polishing with diamond cluster
abrasive slurries)

IT Glass substrates

Polishing
(manufacture of Al (alloy) or glass substrates with grooved surfaces for
magnetic hard disks, by polishing with diamond cluster
abrasive slurries)

IT Fatty acids, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(metal salts, slurry dispersant; manufacture of Al (alloy) or
glass substrates with grooved surfaces for magnetic hard disks, by
polishing with diamond cluster abrasive
slurries)

IT Surfactants

(nonionic, slurry dispersant; manufacture of Al (alloy)
or glass substrates with grooved surfaces for magnetic hard disks, by
polishing with diamond cluster abrasive
slurries)

IT Polyamide fibers, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(polishing cloth; manufacture of Al (alloy) or glass substrates
with grooved surfaces for magnetic hard disks, by polishing
with diamond cluster abrasive slurries)

IT Slurries

(polishing; manufacture of Al (alloy) or glass substrates with
grooved surfaces for magnetic hard disks, by polishing with
diamond cluster abrasive slurries)

IT Glycols, uses

Phosphates, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(slurry dispersant; manufacture of Al (alloy) or glass substrates
with grooved surfaces for magnetic hard disks, by polishing
with diamond cluster abrasive slurries)

IT Amines, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(vegetable oil, slurry dispersant; manufacture of Al (alloy) or
glass substrates with grooved surfaces for magnetic hard disks, by
polishing with diamond cluster abrasive
slurries)

IT Fats and Glyceridic oils, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(vegetable, amines, slurry dispersant; manufacture of Al (alloy) or glass substrates with grooved surfaces for magnetic hard disks, by polishing with diamond cluster abrasive slurries)

IT. Aluminum alloy, base

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(manufacture of Al (alloy) or glass substrates with grooved surfaces for magnetic hard disks, by polishing with diamond cluster abrasive slurries)

IT 7782-40-3, Diamond, uses

RL: TEM (Technical or engineered material use); USES (Uses) (abrasive particles; manufacture of Al (alloy) or glass substrates with grooved surfaces for magnetic hard disks, by polishing with diamond cluster abrasive slurries)

IT 7429-90-5, Aluminum, processes

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(manufacture of Al (alloy) or glass substrates with grooved surfaces for magnetic hard disks, by polishing with diamond cluster abrasive slurries)

L39 ANSWER 10 OF 34 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:198610 HCAPLUS

DN 140:244785

ED Entered STN: 11 Mar 2004

TI Chemical-mechanical polishing process for forming wiring structures, and abrasive compositions used therein

IN Sakai, Kenji; Tamai, Kazumasa; Kawamura, Atsunori; Matsuda, Takeshi; Hirano, Tatsuhiko; Ina, Katsuyoshi

PA Fujimi, Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 22 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C09K003-14

ICS B24B037-00; H01L021-304

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 37, 57

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | JP 2004075862 | A2 | 20040311 | JP 2002-238596 | 20020819 |
| | US 2004084414 | A1 | 20040506 | US 2003-642929 | 20030818 |
| PRAI | JP 2002-238596 | A | 20020819 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|------------|-------|------------------------------------|
|------------|-------|------------------------------------|

| | | |
|---------------|-------|--|
| JP 2004075862 | ICM | C09K003-14 |
| | ICS | B24B037-00; H01L021-304 |
| JP 2004075862 | FTERM | 3C058/AA07; 3C058/CB01; 3C058/DA02; 3C058/DA13; 3C058/DA17 |
| US 2004084414 | NCL | 216/088.000 |
| | ECLA | C09G001/02; C23F003/00 |

OS MARPAT 140:244785

AB The process for polishing of a material having a Cu-based elec. conductive layer formed on a barrier layer on an elec. insulating layer

having concave parts, involves (1) polishing of the elec. conductive layer not to expose the barrier layer with an abrasive composition containing abrasives (A) selected from SiO₂ and Al₂O₃, polishing accelerators (B) selected from glycine and α -alanine, H₂O, and H₂O₂, (2) polishing of the elec. conductive layer to expose the barrier layer with an abrasive composition containing the abrasives (A), the polishing accelerators (B), organic compds. (C) selected from poly(ethylene oxide), poly(propylene oxide), polyoxyethylene alkyl ethers, polyoxypropylene alkyl ethers, polyoxyethylene-polyoxypropylene alkyl ethers, and polyoxyalkylene addition polymers having carbon triple bonds R₁₀(X)_mCR₃R₅C.tplbond.CCR₄R₆(Y)_nOR₂ (R₁-R₆ = H, C₁-10 alkyl; X, Y = ethyleneoxy, propyleneoxy; m, n = 1-20), corrosion inhibitors (D) selected from benzotriazole and its derivs., H₂O₂, and H₂O, and (3) polishing of the barrier layer with an abrasive composition containing the abrasives (A), acids (E) selected from HNO₃, HCl, lactic acid, H₃PO₄, H₂SO₄, AcOH, oxalic acid, citric acid, tartaric acid, malonic acid, succinic acid, maleic acid, and fumaric acid or alkalies (F) selected from KOH, NH₄OH, and NaOH, the corrosion inhibitors (D), and H₂O. The process prevents dishing or erosion.

ST chem mech polishing abrasive compn

wiring; dishing erosion prevention chem mech polishing

IT Alcohols, uses

RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)

(alkoxylated; chemical-mech. polishing process and abrasive compns. for forming wiring structures without dishing or erosion)

IT Polyoxyalkylenes, uses

RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)

(alkyl ethers; chemical-mech. polishing process and abrasive compns. for forming wiring structures without dishing or erosion)

IT Abrasives

Corrosion inhibitors

Electric conductors

Polishing materials

Semiconductor device fabrication

(chemical-mech. polishing process and abrasive compns. for forming wiring structures without dishing or erosion)

IT Acids, uses

Bases, uses

Polyoxyalkylenes, uses

Polyoxyalkylenes, uses

RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)

(chemical-mech. polishing process and abrasive compns. for forming wiring structures without dishing or erosion)

IT Polishing

(chemical-mech.; chemical-mech. polishing process and abrasive compns. for forming wiring structures without dishing or erosion)

IT Alcohols, uses

RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)

(ethoxylated; chemical-mech. polishing

process and abrasive compns. for forming wiring structures without dishing or erosion)

IT 7440-50-8, Polyoxyalkylenes, uses
 RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
 (mono(alkyl group)-terminated; chemical-mech. polishing process and abrasive compns. for forming wiring structures without dishing or erosion)

IT 7440-50-8, Copper, processes
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
 (chemical-mech. polishing process and abrasive compns. for forming wiring structures without dishing or erosion)

IT 50-21-5, Lactic acid, uses 56-40-6, Glycine, uses 56-41-7, α -Alanine, uses 64-19-7, Acetic acid, uses 77-92-9, Citric acid, uses 87-69-4, Tartaric acid, uses 110-15-6, Succinic acid, uses 110-16-7, Maleic acid, uses 110-17-8, Fumaric acid, uses 141-82-2, Malonic acid, uses 144-62-7, Oxalic acid, uses 1310-58-3, Potassium hydroxide, uses 1310-73-2, Sodium hydroxide, uses 1336-21-6, Ammonium hydroxide 1344-28-1, Aluminum oxide, uses 7647-01-0, Hydrochloric acid, uses 7664-38-2, Phosphoric acid, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses 7722-84-1, Hydrogen peroxide, uses 9003-11-6D, Ethylene oxide-propylene oxide copolymer, alkyl ethers 9014-85-1 25322-68-3, Poly(ethylene oxide) 25322-68-3D, Polyethylene glycol, alkyl ethers 25322-69-4, Poly(propylene oxide) 25322-69-4D, Polypropylene glycol, alkyl ethers
 RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
 (chemical-mech. polishing process and abrasive compns. for forming wiring structures without dishing or erosion)

IT 7631-86-9, Colloidal silica, uses
 RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
 (colloidal; chemical-mech. polishing process and abrasive compns. for forming wiring structures without dishing or erosion)

IT 95-14-7, 1H-Benzotriazole
 RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
 (corrosion inhibitor; chemical-mech. polishing process and abrasive compns. for forming wiring structures without dishing or erosion)

IT 7631-86-9, Colloidal silica, uses
 RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
 (colloidal; chemical-mech. polishing process and abrasive compns. for forming wiring structures without dishing or erosion)

RN 7631-86-9 HCPLUS
 CN Silica (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

AN 2004:159198 HCAPLUS
 DN 140:191477
 ED Entered STN: 27 Feb 2004
 TI Lapping oil compositions for finish polishing of
 composites constituted by multiple different-hardness materials,
 especially thin-film magnetic heads

IN Saito, Isao; Orii, Kazuya
 PA Tokyo Magnetic Printing Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 9 pp.
 CODEN: JKXXAF

DT Patent
 LA Japanese
 IC ICM B24B037-00
 ICS C09K003-14; G11B005-31
 CC 77-8 (Magnetic Phenomena)
 Section cross-reference(s): 38, 57

FAN.CNT 1

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------------|------|----------|-----------------|----------|
| PI JP 2004058220 | A2 | 20040226 | JP 2002-220920 | 20020730 |
| PRAI JP 2002-220920 | | 20020730 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|---------------|-------|---|
| JP 2004058220 | ICM | B24B037-00 |
| | | ICS C09K003-14; G11B005-31 |
| JP 2004058220 | FTERM | 3C058/AA07; 3C058/AC04; 3C058/CA01; 3C058/CB02; 3C058/DA02; 5D033/DA22; 5D033/DA31 |

OS MARPAT 140:191477

AB The lapping oil compns., free from abrasive grains,
 contain nonaq. solvents and amine additives. The composites, e.g.,
 metal-ceramic composites, subjected for main polishing with
 dropping nonaq.-solvent slurries containing nonionic
 surfactants as disperse medium and free abrasive grains,
 are finish polished with the lapping oil compns. with
 dropping the compns. The lapping oil compns. can
 easily exclude unfixed abrasive grains for achieving high
 precise finish polishing.

ST finish polishing lapping oil additive amine; composite finish
 polishing lapping oil additive amine; magnetic head finish
 polishing lapping oil additive amine; metal ceramic composite
 finish polishing lapping oil

IT Alcohols, uses

RL: MOA (Modifier or additive use); TEM (Technical or engineered material
 use); USES (Uses)
 (amino; lapping oil compns. containing amine additives
 for finish polishing of composites, especially thin-film magnetic
 heads)

IT Metals, processes

RL: PEP (Physical, engineering or chemical process); PYP (Physical
 process); PROC (Process)
 (composites containing; lapping oil compns. containing amine
 additives for finish polishing of composites, especially thin-film
 magnetic heads)

IT Amines, uses

RL: MOA (Modifier or additive use); TEM (Technical or engineered material
 use); USES (Uses)
 (ethoxylated; lapping oil compns. containing amine
 additives for finish polishing of composites, especially thin-film
 magnetic heads)

IT **Polishing**
 (finish; lapping oil compns. containing amine additives for finish polishing of composites, especially thin-film magnetic heads)

IT Ceramic composites
 Magnetic recording heads
Polishing materials
 (lapping oil compns. containing amine additives for finish polishing of composites, especially thin-film magnetic heads)

IT **Amines, uses**
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
 (secondary; lapping oil compns. containing amine additives for finish polishing of composites, especially thin-film magnetic heads)

IT **Amines, uses**
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
 (tertiary; lapping oil compns. containing amine additives for finish polishing of composites, especially thin-film magnetic heads)

IT 51427-90-8, Iron alloy, Fe,Al, Si
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
 (Sendust, in magnetic heads; lapping oil compns. containing amine additives for finish polishing of composites, especially thin-film magnetic heads)

IT 11068-82-9 113724-99-5, Aluminum titanium carbide oxide
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
 (in magnetic heats; lapping oil compns. containing amine additives for finish polishing of composites, especially thin-film magnetic heads)

IT 110-58-7, Amylamine 111-86-4, Octylamine 112-18-5,
 Dodecyldimethylamine 112-90-3, Oleylamine 124-22-1, Dodecylamine
 124-30-1, Stearylamine 52811-24-2
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
 (lapping oil compns. containing amine additives for finish polishing of composites, especially thin-film magnetic heads)

L39 ANSWER 12 OF 34 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2004-487944 [46] WPIX
 DNN N2004-384927 DNC C2004-181839
 TI **Slurry composition for secondary polishing**
 of silicon wafers, comprises hydroxyalkylcellulose-based water-soluble polymeric thickener and polyoxyethylenealkylamine ether-based nonionic surfactant.
 DC A11 A25 A85 A97 E19 G04 L03 U11
 IN LEE, G S; LEE, I G; NOH, H S; PARK, T W; LEE, I K; LEE, K S; ROH, H S
 PA (CHEI-N) CHEIL IND INC
 CYC 31
 PI WO 2004053968 A1 20040624 (200446)* EN 14 H01L021-304
 RW: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO
 SE SI SK TR
 W: CN JP US
 KR 2004050726 A 20040617 (200466) H01L021-304
 EP 1570512 A1 20050907 (200559) EN H01L021-304

R: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT
RO SE SI SK TR

ADT WO 2004053968 A1 WO 2003-KR1532 20030730; KR 2004050726 A KR 2002-77860
20021209; EP 1570512 A1 EP 2003-812702 20030730, WO 2003-KR1532 20030730

FDT EP 1570512 A1 Based on WO 2004053968

PRAI KR 2002-77860 20021209

IC ICM H01L021-304

AB WO2004053968 A UPAB: 20040720

NOVELTY - A slurry composition comprises (weight%)
colloidal silica having an average particle diameter of 30-80 nm
as an abrasive (2-10), ammonia (0.5-1.5), a
hydroxyalkylcellulose-based water-soluble polymeric thickener (0.2-1), a
polyoxyethylenealkylamine ether-based nonionic
surfactant (0.03-0.5), a quaternary ammonium base (0.01-1), and
deionized water (balance).

USE - For secondary polishing of silicon wafers during
chemical mechanical polishing (CMP)
process.

ADVANTAGE - The composition is capable of increasing the
dispersion stability of silica as an abrasive to
improve the polishing quality on pitted microscratches and
reducing the amount of silica particles to lower the
manufacturing cost. It has a low concentration of silica and
high dispersibility.

Dwg.0/0

FS CPI EPI

FA AB; DCN

MC CPI: A03-A04A; A12-E07C; E07-D05; E10-A22E; E10-A22G; E10-B03B3; E31-P03;
E32-A02; G04-B08; L04-C27

EPI: U11-A10; U11-C06A1A

L39 ANSWER 13 OF 34 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 2004-784203 [77] WPIX

DNN N2004-618064 DNC C2004-274426

TI Aqueous solution for use in processing semiconductor wafers, comprises
block copolymer surfactant and abrasive particles of silica,
alumina, and/or ceria.

DC A25 A26 A85 L03 U11

IN COOPER, K E; FLAKE, J C; GROSCHOPF, J; SOLOMENTSEV, Y E

PA (COOP-I) COOPER K E; (FLAK-I) FLAKE J C; (GROS-I) GROSCHOPF J; (SOLO-I)
SOLOMENTSEV Y E

CYC 1

PI US 2004224426 A1 20041111 (200477)* 7 H01L021-00

ADT US 2004224426 A1 US 2003-430987 20030507

PRAI US 2003-430987 20030507

IC ICM H01L021-00

ICS C09K003-14

AB US2004224426 A UPAB: 20041203

NOVELTY - Aqueous solution comprises a block copolymer surfactant having a
hydrophobic portion and a hydrophilic portion, and abrasive particles. The
abrasive particles comprise silica, alumina, and/or ceria.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a
method for processing semiconductor wafers comprising providing a
semiconductor wafer (150) having a wafer surface to a semiconductor
processing stage, and applying a block copolymer surfactant having a
hydrophobic portion and a hydrophilic portion to the wafer surface during
the semiconductor processing stage.

USE - For use in processing semiconductor wafers (claimed).

ADVANTAGE - The inventive aqueous solution is a reliable solution
that minimizes surface defects and does not require large additive

concentrations. The surfactant in the aqueous solution is a surface-active agent that reduces surface tension of a liquid or surface tension between a liquid and a solid.

DESCRIPTION OF DRAWING(S) - The figure illustrates a schematic of a chemical mechanical polishing processing tool that can be used in processing semiconductor wafers.

Chemical mechanical polishing tool 100

Semiconductor wafer 150

Polish film 155

Drive assembly 191

Actuator assembly 192

Dwg.1/2

FS CPI EPI

FA AB; GI

MC CPI: A12-H10; A12-W12C; L04-C07C; L04-C07F; L04-C09; L04-C27

EPI: U11-A10; U11-C06A1A

L39 ANSWER 14 OF 34 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2004-286736 [27] WPIX

DNN N2004-227376 DNC C2004-110441

TI Application composition for manufacture of insulating thin film, contains organic polymer, organic solvent(s) and silica precursor containing compound(s) chosen from alkoxy silane and its hydrolysis substance, and polycondensate.

DC A26 A85 L03 U11

PA (ASAHI) ASAHI KASEI KK

CYC 1

PI JP 2004018608 A 20040122 (200427)* 28 C09D183-04

ADT JP 2004018608 A JP 2002-173542 20020614

PRAI JP 2002-173542 20020614

IC ICM C09D183-04

ICS C09D001-00; C09D005-25; C09D171-02; C09D183-02; H01L021-316; H01L021-768

AB JP2004018608 A UPAB: 20040426

NOVELTY - Application composition contains silica precursor, organic polymer and organic solvent(s) chosen from alcohol, ketone, amide and ester. The silica precursor contains compound(s) chosen from 1-6 functional alkoxy silane and its hydrolysis substance, and polycondensate. The organic polymer contains aliphatic ether block copolymer of binary or ternary.

DETAILED DESCRIPTION - Application composition contains silica precursor, organic polymer and at least one type of organic solvent selected from alcohol, ketone, amide and ester. The silica precursor contains at least one type of compound chosen from 1-6 functional alkoxy silane and its hydrolysis substance, and a polycondensate. The alkoxy silane is of formula (1) and/or formula (2):

R1n(Si)(OR2)4-n (1)

R3m(R4O)3-mSi-(R7)p-Si(OR5)3-qR6q (2)

R1-R6 = hydrogen or univalent organic group;

n = 0-3;

m and q = 0-2;

R7 = group with oxygen atom or (CH2)r;

r = 1-6; and

p = 0 or 1.

The sum of silicon atom originating in the alkoxy silane of 1-3 functionality and its hydrolysis substance, and polycondensate with respect to the total of the silicon atom originating in the alkoxy silane and its hydrolysis substance, is 5-80 mol%. The organic polymer contains 10 weight% or more of aliphatic ether block copolymer of binary or ternary except poly(ethylene oxide)-poly(propylene

oxide)-poly(ethylene oxide) which is a ternary block copolymer, with respect to all organic polymers. The block copolymer is of formula: $((R8O)_x \cdot (R1O)_y \cdot (R9O)_z)$.

R8-R10 = 1-10C alkylene group;
 x = 2-200;
 y = 2-100; and
 z = 0-200.

INDEPENDENT CLAIMS are included for the following:

- (1) insulating thin film;
- (2) wiring structure using the insulating thin film as insulator; and
- (3) semiconductor element with wiring structure.

USE - For manufacture of insulating thin film for wiring structure used for semiconductor element (claimed) and large scale integrated multilayer interconnections.

ADVANTAGE - The porous thin film with stable and low dielectric constant, is formed using the application composition. The thin film has mechanical strength which endures chemical mechanical polishing process in copper-wiring process of semiconductor element, and hence suitable for insulating films of substrate for large scale integration multilayer interconnections or semiconductor element.

Dwg.0/0

FS CPI EPI
 FA AB
 MC CPI: A05-H01B; A06-A00E2; A08-S02; A12-E07C; L04-C12E
 EPI: U11-C05A

L39 ANSWER 15 OF 34 HCAPLUS COPYRIGHT 2005 ACS on STN 
 AN 2003:481849 HCAPLUS

DN 139:40498

ED Entered STN: 24 Jun 2003

TI Abrasive compositions for CMP of device wafers

IN Miyazaki, Tadakazu

PA Sanyo Chemical Industries, Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C09K003-14

ICS B24B037-00; H01L021-304

CC 57-7 (Ceramics)

Section cross-reference(s): 76

FAN.CNT 1

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------------|------|----------|-----------------|----------|
| PI JP 2003176479 | A2 | 20030624 | JP 2002-280113 | 20020926 |
| PRAI JP 2001-298001 | A | 20010927 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|------------|-------|------------------------------------|
|------------|-------|------------------------------------|

| | | |
|---------------|-----|-------------------------|
| JP 2003176479 | ICM | C09K003-14 |
| | ICS | B24B037-00; H01L021-304 |

AB The abrasive compns. contain polyoxyalkylene ethers represented by general formula $Z[(CH_2CH_2O)_a(AO)_b]R^p$ [R = C1-18 alkenyl, C2-18 alkenyl or alkaphenyl, C2-24 acyl, H; Z = H-removed residues of C1-12 p-valent alcs.; A = C3-4 alkylene; a, b = 1-100 integer; units of (CH_2CH_2O) and (AO) are randomly bonded or block bonded; weight ratio of CH_2CH_2O group and AO group = 30/70-70/30' p = 1-6 integer], aliphatic carboxylic acid amides, and water. The abrasives may comprise inorg. compds. selected from SiO_2 , Al_2O_3 , Ce oxide, Si_3N_4 , and ZrO_2 .

In the process, device wafers with wirings being formed are polished with the abrasive compns. Scratches on wafer surfaces have been suppressed.

ST chem mech polishing abrasive compn surfactant; semiconductor device wafer CMP abrasive compn; polyoxyalkylene nonionic surfactant chem mech polishing; aliphatic carboxylic acid amide surfactant CMP

IT Abrasives (abrasive compns. containing polyoxyalkylene ethers and aliphatic carboxylic acid amides for CMP of device wafers)

IT Amides, uses RL: MOA (Modifier or additive use); NUU (Other use, unclassified); USES (Uses) (aliphatic; abrasive compns. containing polyoxyalkylene ethers and aliphatic carboxylic acid amides for CMP of device wafers)

IT Polishing (chemical-mech.; abrasive compns. containing polyoxyalkylene ethers and aliphatic carboxylic acid amides for CMP of device wafers)

IT Polyoxyalkylenes, uses RL: MOA (Modifier or additive use); NUU (Other use, unclassified); USES (Uses) (ethers; abrasive compns. containing polyoxyalkylene ethers and aliphatic carboxylic acid amides for CMP of device wafers)

IT Surfactants (nonionic; abrasive compns. containing polyoxyalkylene ethers and aliphatic carboxylic acid amides for CMP of device wafers)

IT 93-83-4, Oleic acid diethanolamide 111-58-0, Oleic acid monoethanolamide 106392-12-5, Ethylene oxide-propylene oxide block copolymer RL: MOA (Modifier or additive use); NUU (Other use, unclassified); USES (Uses) (abrasive compns. containing polyoxyalkylene ethers and aliphatic carboxylic acid amides for CMP of device wafers)

IT 1306-38-3, Cerium oxide, uses 1314-23-4, Zirconium oxide, uses 1344-28-1, Alumina, uses 12033-89-5, Silicon nitride, uses RL: NUU (Other use, unclassified); USES (Uses) (abrasive compns. containing polyoxyalkylene ethers and aliphatic carboxylic acid amides for CMP of device wafers)

IT 7631-86-9, Colloidal silica, uses RL: NUU (Other use, unclassified); USES (Uses) (colloidal; abrasive compns. containing polyoxyalkylene ethers and aliphatic carboxylic acid amides for CMP of device wafers)

IT 106392-12-5, Ethylene oxide-propylene oxide block copolymer RL: MOA (Modifier or additive use); NUU (Other use, unclassified); USES (Uses) (abrasive compns. containing polyoxyalkylene ethers and aliphatic carboxylic acid amides for CMP of device wafers)

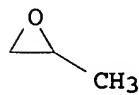
RN 106392-12-5 HCAPLUS

CN Oxirane, methyl-, polymer with oxirane, block (9CI) (CA INDEX NAME)

CM 1

CRN 75-56-9

CMF C3 H6 O



CM 2

CRN 75-21-8
CMF C2 H4 O

IT 7631-86-9, Colloidal silica, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (colloidal; abrasive compns. containing polyoxyalkylene ethers
 and aliphatic carboxylic acid amides for CMP of device wafers)
 RN 7631-86-9 HCAPLUS
 CN Silica (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



L39 ANSWER 16 OF 34 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2003:443964 HCAPLUS
 DN 139:15944
 ED Entered STN: 10 Jun 2003
 TI Coating composition for manufacture of electrically insulating
 porous silica film used in wiring structure of semiconductor
 device
 IN Hanahata, Hiroyuki
 PA Asahi Kasei Corporation, Japan
 SO Jpn. Kokai Tokkyo Koho, 15 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C09D183-02
 ICS C01B033-12; C09D001-00; C09D005-25; C09D153-00; C09D171-02;
 C09D183-04; H01L021-312; H01L021-316
 CC 76-3 (Electric Phenomena)
 Section cross-reference(s): 38

FAN.CNT 1

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------------|------|----------|-----------------|----------|
| PI JP 2003165952 | A2 | 20030610 | JP 2001-364582 | 20011129 |
| PRAI JP 2001-364582 | | 20011129 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|---------------|-------|---|
| JP 2003165952 | ICM | C09D183-02 |
| | ICS | C01B033-12; C09D001-00; C09D005-25; C09D153-00; C09D171-02; C09D183-04; H01L021-312; H01L021-316 |

OS MARPAT 139:15944

AB The composition comprises (1) silica precursors containing (A)

Si(OR₁)₄ (R₁ = divalent organic group), its hydrolyzate, and/or its polycondensate and/or (B) R₂Si(OR₁)₃ (R₁, R₂ = divalent organic group), its hydrolyzate, and/or its polycondensate to satisfy mol. fraction of (B-derived Si)/[(A-derived Si) + (B-derived Si)] 1-50 mol% (excluding 50 mol%), (2) organic polymers containing linear or branched block copolymers, and (3) solvents of alcs., ketones, amides, and/or esters. The porous SiO₂ film is manufactured by coating a substrate with the compn ., converting the silica precursors to a gel to give a silica-organic polymer composite film, and removing the organic polymers from the composite film. The porous film has low dielec. constant and high durability in chemical mech. polishing in Cu wiring process, and scarcely generates pollutant gases in via-hole formation.

ST silica precursor org polymer porous film insulator; alkoxysilane block copolymer porous silica film manuf

IT Silanes
RL: RCT (Reactant); RACT (Reactant or reagent)
(alkoxy; alkoxysilane-organic block copolymer compns. for manufacture of elec. insulating porous silica film in semiconductor device)

IT Dielectric films
Semiconductor devices
Sol-gel processing
(alkoxysilane-organic block copolymer compns. for manufacture of elec. insulating porous silica film in semiconductor device)

IT Porous materials
(films; alkoxysilane-organic block copolymer compns. for manufacture of elec. insulating porous silica film in semiconductor device)

IT Films
(porous; alkoxysilane-organic block copolymer compns. for manufacture of elec. insulating porous silica film in semiconductor device)

IT 7631-86-9P, Silica, uses
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(alkoxysilane-organic block copolymer compns. for manufacture of elec. insulating porous silica film in semiconductor device)

IT 132894-01-0, Ethylene oxide-propylene oxide block copolymer dimethyl ether
RL: NUU (Other use, unclassified); REM (Removal or disposal); PROC (Process); USES (Uses)
(alkoxysilane-organic block copolymer compns. for manufacture of elec. insulating porous silica film in semiconductor device)

IT 78-10-4, Tetraethoxysilane 2031-67-6, Methyltriethoxysilane
RL: RCT (Reactant); RACT (Reactant or reagent)
(alkoxysilane-organic block copolymer compns. for manufacture of elec. insulating porous silica film in semiconductor device)

IT 24991-55-7, Polyethylene glycol dimethyl ether
RL: NUU (Other use, unclassified); REM (Removal or disposal); PROC (Process); USES (Uses)
(block copolymers mixed with; alkoxysilane-organic block copolymer compns. for manufacture of elec. insulating porous silica film in semiconductor device)

IT 7631-86-9P, Silica, uses
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(alkoxysilane-organic block copolymer compns. for manufacture of elec. insulating porous silica film in semiconductor device)

RN 7631-86-9 HCAPLUS

CN Silica (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

L39 ANSWER 17 OF 34 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2003:239915 HCAPLUS
 DN 138:264107
 ED Entered STN: 28 Mar 2003
 TI Coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device
 IN Hanahata, Hiroyuki; Ioka, Takaaki
 PA Asahi Kasei Corporation, Japan
 SO Jpn. Kokai Tokkyo Koho, 18 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C09D183-04
 ICS C09D171-00; C09D183-02; C09D183-14; H01L021-316
 CC 76-3 (Electric Phenomena)
 Section cross-reference(s): 37

FAN.CNT 1

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------------|------|----------|-----------------|----------|
| PI JP 2003089769 | A2 | 20030328 | JP 2001-283539 | 20010918 |
| PRAI JP 2001-283539 | | 20010918 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|---------------|-------|---|
| JP 2003089769 | ICM | C09D183-04 |
| | | ICS C09D171-00; C09D183-02; C09D183-14; H01L021-316 |

AB The composition comprises (A) silica precursors containing R1nSi(OR2)4-n (R1, R2 = monovalent organic residue; n = 0-3) and/or R3m(R4O)3-mSiR7pSi(OR5)3-qR6q (R3-R6 = monovalent organic residue; m, q = 0-2; R7 = O, (CH2)r; r = 1-6; p = 0, 1), their hydrolyzates, and/or their polycondensation products to satisfy Si molar fraction of mono-, di- and trifunctional alkoxy silanes to total Si in mono-, di-, tri-, tetra-, penta- and hexa-functional alkoxy silanes 1-50 mol%, (B) linear or branched polyether block copolymer-containing organic polymers, and (C) organic solvents of alcs., ketones, amides, and/or esters. The porous insulating film claimed is obtained by coating a substrate with the composition, forming a silica/organic polymer composite film by gelation of the silica precursors, and removing the organic polymers from the composite film. The porous film has low specific dielec. constant and high durability in chemical mech. polishing in Cu wiring process for semiconductor device fabrication and scarcely generates pollutant gases in via-hole formation.

ST semiconductor device wiring porous silica insulator film; silica precursor org polymer coating insulator manuf; alkoxy silane polyether block copolymer coating silica film manuf

IT Silanes

RL: RCT (Reactant); RACT (Reactant or reagent)
 (alkoxy; alkoxy silane- and organic polymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

IT Dielectric films

Semiconductor devices

Sol-gel processing

(alkoxysilane- and organic polymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

IT Polyoxyalkylenes, processes

RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(block; alkoxysilane- and organic polymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

IT Porous materials

(films; alkoxysilane- and organic polymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

IT Films

(porous; alkoxysilane- and organic polymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

IT Polysiloxanes, preparation

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(silicate-, silica precursor; alkoxysilane- and organic polymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

IT 24991-55-7, Polyethylene glycol dimethyl ether 106392-12-5,

Polyethylene glycol-polypropylene glycol block copolymer

RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(alkoxysilane- and organic polymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

IT 7631-86-9P, Silica, uses

RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(alkoxysilane- and organic polymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

IT 502612-69-3P, Bis(triethoxysilyl)ethane-dimethyldiethoxysilane-tetraethoxysilane copolymer

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(silica precursor; alkoxysilane- and organic polymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

IT 106392-12-5, Polyethylene glycol-polypropylene glycol block copolymer

RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(alkoxysilane- and organic polymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

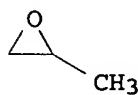
RN 106392-12-5 HCPLUS

CN Oxirane, methyl-, polymer with oxirane, block (9CI) (CA INDEX NAME)

CM 1

CRN 75-56-9

CMF C3 H6 O



CM 2

CRN 75-21-8
CMF C2 H4 O

IT 7631-86-9P, Silica, uses

RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (alkoxysilane- and organic polymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

RN 7631-86-9 HCPLUS

CN Silica (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



L39 ANSWER 18 OF 34 HCPLUS COPYRIGHT 2005 ACS on STN

AN 2003:239914 HCPLUS

DN 138:264106

ED Entered STN: 28 Mar 2003

TI Coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device

IN Hanahata, Hiroyuki; Ioka, Takaaki

PA Asahi Kasei Corporation, Japan

SO Jpn. Kokai Tokkyo Koho, 17 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C09D183-02

ICS C09D001-00; C09D005-25; C09D183-04; C09D201-00; H01L021-312

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 37

FAN.CNT 1

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------------|------|----------|-----------------|----------|
| PI JP 2003089768 | A2 | 20030328 | JP 2001-283571 | 20010918 |
| PRAI JP 2001-283571 | | 20010918 | | |

CLASS

PATENT NO. CLASS PATENT FAMILY CLASSIFICATION CODES

| | | |
|---------------|-----|---|
| JP 2003089768 | ICM | C09D183-02 |
| | ICS | C09D001-00; C09D005-25; C09D183-04; C09D201-00; H01L021-312 |

AB The composition comprises (A) silica precursors containing (1) $\text{Si}(\text{OR}_1)_4$, their hydrolyzates, and/or their polycondensation products and

(2) R₂₂Si(OR₁)₂ and/or R₂₃Si(OR₁), their hydrolyzates, and/or their polycondensation products (R₁, R₂ = monovalent organic residue) to satisfy Si molar fraction in (2) to total Si in (1) and (2) 1-50 mol%, (B) linear or branched block copolymer-containing organic polymers, and (C) solvents of alcs., ketones, amides, and/or esters. The porous insulating film is manufactured by coating a substrate with the composition, forming a silica /organic polymer composite film by gelation of the silica precursors, and removing the organic polymers from the composite film. The porous film has low specific dielec. constant and high durability in chemical mech. polishing in Cu wiring process for semiconductor device fabrication and scarcely generates pollutant gases in via-hole formation.

ST semiconductor device wiring porous silica insulator film; silica precursor org polymer coating insulator manuf; alkoxy silane block copolymer coating silica film manuf

IT Silanes

RL: RCT (Reactant); RACT (Reactant or reagent)
(alkoxy; alkoxy silane- and block copolymer-containing coating compn
. for manufacture of porous insulating silica film in wiring
structure in semiconductor device)

IT Dielectric films

Semiconductor devices

Sol-gel processing

(alkoxy silane- and block copolymer-containing coating composition for
manufacture of porous insulating silica film in wiring structure
in semiconductor device)

IT Polyoxyalkylenes, processes

RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical,
engineering or chemical process); PROC (Process); USES (Uses)
(block; alkoxy silane- and block copolymer-containing coating compn
. for manufacture of porous insulating silica film in wiring
structure in semiconductor device)

IT Porous materials

(films; alkoxy silane- and block copolymer-containing coating compn
. for manufacture of porous insulating silica film in wiring
structure in semiconductor device)

IT Films

(porous; alkoxy silane- and block copolymer-containing coating compn
. for manufacture of porous insulating silica film in wiring
structure in semiconductor device)

IT Polysiloxanes, preparation

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
(Reactant or reagent)
(silicate-, silica precursor; alkoxy silane- and block
copolymer-containing coating composition for manufacture of porous
insulating silica film in wiring structure in semiconductor
device)

IT 106392-12-5, Polyethylene glycol-polypropylene glycol block
copolymer

RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical,
engineering or chemical process); PROC (Process); USES (Uses)
(alkoxy silane- and block copolymer-containing coating composition for
manufacture of porous insulating silica film in wiring structure
in semiconductor device)

IT 7631-86-9P, Silica, uses

RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(alkoxy silane- and block copolymer-containing coating composition for
manufacture of porous insulating silica film in wiring structure
in semiconductor device)

IT 88029-68-9P, Dimethyldiethoxysilane-tetraethoxysilane copolymer
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (silica precursor; alkoxy silane- and block copolymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

IT 78-10-4, Tetraethoxysilane 1825-62-3, Trimethylethoxysilane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (silica precursor; alkoxy silane- and block copolymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

IT 106392-12-5, Polyethylene glycol-polypropylene glycol block copolymer
 RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (alkoxy silane- and block copolymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

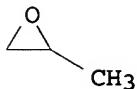
RN 106392-12-5 HCPLUS

CN Oxirane, methyl-, polymer with oxirane, block (9CI) (CA INDEX NAME)

CM 1

CRN 75-56-9

CMF C3 H6 O



CM 2

CRN 75-21-8

CMF C2 H4 O



IT 7631-86-9P, Silica; uses

RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (alkoxy silane- and block copolymer-containing coating composition for manufacture of porous insulating silica film in wiring structure in semiconductor device)

RN 7631-86-9 HCPLUS

CN Silica (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

L39 ANSWER 19 OF 34 HCPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:570697 HCPLUS
 DN 137:133148

ED Entered STN: 01 Aug 2002
 TI Reduction of surface roughness during chemical mechanical planarization (CMP) in electronic device fabrication
 IN Kramer, Stephen J.; Meikle, Scott G.
 PA Micron Technology, Inc., USA
 SO U.S., 14 pp., Cont.-in-part of U.S. Ser. No. 252,022.
 CODEN: USXXAM
 DT Patent
 LA English
 IC ICM H01L021-00
 INCL 438692000
 CC 76-3 (Electric Phenomena)
 Section cross-reference(s): 66

FAN.CNT 2

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | US 6426295 | B1 | 20020730 | US 2000-584468 | 20000531 |
| | US 6409936 | B1 | 20020625 | US 1999-252022 | 19990216 |
| | US 2002182868 | A1 | 20021205 | US 2002-209035 | 20020730 |
| | US 6630403 | B2 | 20031007 | | |
| PRAI | US 1999-252022 | A2 | 19990216 | | |
| | US 2000-584468 | A1 | 20000531 | | |

CLASS

| | PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|--|---------------|-------|---|
| | US 6426295 | ICM | H01L021-00 |
| | | INCL | 438692000 |
| | US 6426295 | NCL | 438/692.000; 216/038.000; 216/088.000; 216/089.000; 252/079.100; 438/693.000; 438/745.000 |
| | | ECLA | B24B037/04I; B24B057/02; C09G001/02 |
| | US 6409936 | NCL | 252/079.100; 216/088.000; 216/089.000; 216/090.000; 216/091.000; 216/092.000; 252/079.200; 252/079.300; 252/079.400; 252/079.500; 252/363.500; 438/690.000; 438/691.000; 438/692.000; 438/693.000; 451/285.000; 451/286.000; 451/287.000; 451/288.000 |
| | | ECLA | B24B037/04I; B24B057/02; C09G001/02 |
| | US 2002182868 | NCL | 438/692.000 |
| | | ECLA | B24B037/04I; B24B057/02; C09G001/02 |

AB Improved methods, compns. and structures formed therefrom are provided that allow for reduction of roughness in layers (e.g., oxide layers) of a planarized wafer. In one such embodiment, improved methods, compns. and structures formed therefrom for reduction of roughness in layers (e.g., oxide layers) of a planarized wafer were used in conjunction with high modulus polyurethane pads. In one embodiment, improved methods, compns. and structures formed therefrom are provided that reduce rough interlayer dielec. (ILD) conditions for a wafer during CMP processing of such a wafer. Accordingly, this reduction of rough ILD reduces chatter scratches which are scratches that emanate from regions of a wafer that has undergone CMP processing. Advantageously, reduction in chatter scratching reduces cracking (i.e., wormholing) in layers of the wafer that were planarized. Therefore, reduction in cracking decreases access of cleaning chemistries to underlying structures of the wafer during subsequent chemical cleaning of the planarized wafer, thereby reducing damage to such underlying structures from these cleaning chemistries (e.g., reduction of metal voids in underlying metal structures). Embodiments of a method for forming a microelectronic substrate include mixing a surfactant at least 100 ppm to slurries to form a polishing solution. The method also includes chemical-mech. planarizing of the semiconductor wafer using the polishing solution. Addnl., embodiments of a polishing solution for chemical-mech. planarizing a microelectronic

substrate includes slurries and a surfactant at least 100 ppm to the slurries.

ST chem mech polishing slurry
surfactant electronic device fabrication

IT Polishing
(chemical-mech.; reduction of surface roughness during chemical mech. planarization (CMP) in electronic device fabrication)

IT Surfactants
(nonionic; reduction of surface roughness during chemical mech. planarization (CMP) in electronic device fabrication)

IT Polymers, uses
Polyurethanes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polishing pads; reduction of surface roughness during chemical mech. planarization (CMP) in electronic device fabrication)

IT Crack (fracture)
Dielectric films
Slurries
Surface roughness
Surfactants
(reduction of surface roughness during chemical mech. planarization (CMP) in electronic device fabrication)

IT 7631-86-9, Silica, uses 9002-92-0, Polyoxyethylene lauryl ether 9004-95-9, Polyoxyethylene cetyl ether 9004-98-2, Polyoxyethylene oleyl ether 9005-00-9, Polyoxyethylene stearyl ether
RL: NUU (Other use, unclassified); USES (Uses)
(reduction of surface roughness during chemical mech. planarization (CMP) in electronic device fabrication)

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Anon; McGraw-Hill Concise Encyclopedia of Science & Technology, Fourth Edition 1998, P1931
- (2) Blackwell; US 5320706 A 1994
- (3) Cook; US 5489233 A 1996
- (4) Griesshammer; US 4070797 A 1978
- (5) Griesshammer; US 4156619 A 1979
- (6) Grover; US 5759917 A 1998 HCPLUS
- (7) Hiemenz, P; Principles of Colloid and Surface Chemistry, 2nd ed 1986, P428
- (8) Hosali; US 5738800 A 1998
- (9) Huynh; US 5704987 A 1998
- (10) Isobe; US 5616212 A 1997 HCPLUS
- (11) Lyons; US 5930645 A 1999 HCPLUS
- (12) Olmstead; US 5193316 A 1993
- (13) Shamouillan; US 5584146 A 1996
- (14) Sherman; US 4724042 A 1988 HCPLUS
- (15) Sova; US 4563257 A 1986 HCPLUS
- (16) Wang; US 6046112 A 2000 HCPLUS

IT 7631-86-9, Silica, uses
RL: NUU (Other use, unclassified); USES (Uses)
(reduction of surface roughness during chemical mech. planarization (CMP) in electronic device fabrication)

RN 7631-86-9 HCPLUS

CN Silica (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

L39 ANSWER 20 OF 34 HCPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:397875 HCPLUS
 DN 136:394390
 ED Entered STN: 28 May 2002
 TI Chemical mechanical polishing slurries with balanced high polishing speed and low erosion, and manufacture of semiconductor devices using them in damascene process
 IN Nanpuku, Manabu; Yano, Hiroyuki
 PA Toshiba Corp., Japan
 SO Jpn. Kokai Tokkyo Koho, 7 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C09K003-14
 ICS C09K003-14; B24B037-00; H01L021-304; H01L021-306
 CC 76-3 (Electric Phenomena)

FAN.CNT 1

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------------|------|----------|-----------------|----------|
| PI JP 2002155268 | A2 | 20020528 | JP 2000-352451 | 20001120 |
| PRAI JP 2000-352451 | | 20001120 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|---------------|-------|--|
| JP 2002155268 | ICM | C09K003-14 |
| | | ICS C09K003-14; B24B037-00; H01L021-304; H01L021-306 |

AB The slurry comprises a solvent, abrasives, a 1st surfactant, and a 2nd surfactant. The surfactants are preferably nonionic or those with the same polarity as each other, and the abrasives are preferably nonionic or those with the same polarity as the surfactants.

ST chem mech polishing slurry semiconductor damascene; abrasive slurry surfactant CMP reduced erosion

IT Complexing agents

Oxidizing agents

Semiconductor device fabrication

Surfactants

(CMP slurry with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT Polishing materials

(abrasive pastes; CMP slurry with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT Polyoxyalkylenes, uses

RL: NUU (Other use, unclassified); USES (Uses)
 (alkyl allyl ethers, alkyl amines, surfactant; CMP slurry with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT Sulfates, uses

RL: NUU (Other use, unclassified); USES (Uses)
 (alkyl derivs., surfactant; CMP slurry with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT Quaternary ammonium compounds, uses

RL: NUU (Other use, unclassified); USES (Uses)
 (alkyltrimethyl, surfactant; CMP slurry with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT Polishing

(chemical-mech.; **CMP slurry** with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT **Abrasives**
(polishing pastes; **CMP slurry** with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT **Amines, uses**
RL: NUU (Other use, unclassified); USES (Uses)
(salts, alkyl derivs., surfactant; **CMP slurry** with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT **Fatty acids, uses**
RL: NUU (Other use, unclassified); USES (Uses)
(salts, surfactant; **CMP slurry** with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT **Carbohydrates, uses**
RL: NUU (Other use, unclassified); USES (Uses)
(sugar esters, surfactant; **CMP slurry** with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT 56-40-6, Glycine, uses 56-41-7, Alanine, uses 59-67-6, Nicotinic acid, uses 73-22-3, Tryptophane, uses 98-98-6, Picolinic acid 110-15-6, Succinic acid, uses 141-82-2, Malonic acid, uses 144-62-7, Oxalic acid, uses
RL: NUU (Other use, unclassified); USES (Uses)
(additive; **CMP slurry** with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT 14265-44-2, Phosphate, uses
RL: NUU (Other use, unclassified); USES (Uses)
(alkyl derivs., surfactant; **CMP slurry** with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT 89-00-9, Quinolinic acid 93-10-7, Quinaldic acid
RL: NUU (Other use, unclassified); USES (Uses)
(complexing agent; **CMP slurry** with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT 7722-84-1, Hydrogen peroxide, uses 7727-21-1, Potassium persulfate
7727-54-0, Ammonium persulfate 10421-48-4, Ferric nitrate 15078-94-1, Ammonium cerium nitrate
RL: NUU (Other use, unclassified); USES (Uses)
(oxidant; **CMP slurry** with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

IT 56-81-5D, Glycerin, esters 1331-61-9, Dodecylbenzenesulfonic acid ammonium salt 1875-92-9D, Dimethylbenzyl ammonium chloride, alkyl derivs. 9002-92-0, Poly(oxyethylene) lauryl ether 12441-09-7D, Sorbitan, esters 25322-68-3D, alkyl allyl ethers, alkyl amines 27177-77-1, Dodecylbenzenesulfonic acid potassium salt 94653-96-0D, Naphthalenesulfonic acid potassium salt, alkyl derivs.
RL: NUU (Other use, unclassified); USES (Uses)
(surfactant; **CMP slurry** with balanced high polishing speed and low erosion for damascene processes in semiconductor device fabrication)

DNC C2002-046084
 TI **Chemical mechanical polishing slurry**
 composition for polishing substrate comprises
 abrasive and oxidizing agent.
 DC G04 P61
 IN MAHULIKAR, D; PASQUALONI, A M
 PA (ARCH-N) ARCH SPECIALTY CHEM INC; (PLAN-N) PLANAR SOLUTIONS LLC
 CYC 25
 PI WO 2002004573 A2 20020117 (200219)* EN 18 C09K000-00
 RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
 W: JP KR SG
 US 6468913 B1 20021022 (200273) H01L021-00
 EP 1354017 A2 20031022 (200370) EN C09K003-00
 R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
 KR 2003059070 A 20030707 (200377) C09K003-14
 JP 2004502860 W 20040129 (200413) 32 C09K003-14
 TW 574347 A 20040201 (200453) C09K013-00
 ADT WO 2002004573 A2 WO 2001-US10491 20010402; US 6468913 B1 US 2000-611702
 20000708; EP 1354017 A2 EP 2001-922992 20010402, WO 2001-US10491 20010402;
 KR 2003059070 A KR 2003-700216 20030107; JP 2004502860 W WO 2001-US10491
 20010402, JP 2002-509430 20010402; TW 574347 A TW 2001-113232 20010531
 FDT EP 1354017 A2 Based on WO 2002004573; JP 2004502860 W Based on WO
 2002004573
 PRAI US 2000-611702 20000708
 IC ICM C09K000-00; C09K003-00; C09K003-14; C09K013-00; H01L021-00
 ICS B24B037-00; C09G001-00; H01L021-304
 AB WO 200204573 A UPAB: 20040920

NOVELTY - Chemical mechanical polishing slurry composition comprises an abrasive including silica, alumina, ceria, or their mixtures; and an oxidizing agent. The slurry has an effective shelf life of at least 30 days.

DETAILED DESCRIPTION - Chemical mechanical polishing slurry composition comprises an abrasive including silica, alumina, ceria, or their mixtures; and an oxidizing agent including hydrogen peroxide, potassium ferricyanide, potassium dichromate, potassium iodate, potassium bromate, vanadium trioxide, hypochlorous acid, sodium hypochlorite, potassium hypochlorite, calcium hypochlorite, magnesium hypochlorite, ferric nitrate, ammonium persulfate, potassium permanganate, or their mixtures. The slurry has an effective shelf life of at least 30 days.

INDEPENDENT CLAIMS are also included for (A) a method of polishing a substrate, which comprises providing a substrate with at least one metal layer, applying the inventive slurry composition, and chemically mechanically polishing the substrate with the slurry; and (B) a method of preparing a chemical mechanical polishing slurry, which comprises mixing an abrasive with an oxidizer, and storing the slurry prior to use.

USE - The slurry composition is used for chemical mechanical polishing of metal substrates on semiconductor wafers.

ADVANTAGE - The inventive slurry composition is ready-to-use and stable over long term storage at ambient conditions. Its use in a chemical mechanical polishing process promotes high removal rates, low defect densities, and reduced amounts of dishing and erosion.

Dwg.0/0
 FS CPI GMPI
 FA AB

MC CPI: G04-B04

L39 ANSWER 22 OF 34 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2003-185553 [19] WPIX
 DNN N2003-146128 DNC C2003-049112
 TI **Chemical/mechanical polishing slurry**
 , used in producing shallow trench insulation in silicon wafer with oxide and nitride coatings, comprises abrasive particles in aqueous solution containing two different passivating agents.
 DC A85 E19 G02 L02 L03 P61 U11
 IN HAH, S; LEE, J; YOON, B; HA, S R; LEE, J D; LEE, J W; YOON, B E
 PA (SMSU) SAMSUNG ELECTRONICS CO LTD; (HAHS-I) HAH S; (LEEJ-I) LEE J;
 (YOON-I) YOON B
 CYC 6
 PI DE 10160174 A1 20021017 (200319)* 16 C09G001-02
 JP 2002313760 A 20021025 (200319) 11 H01L021-304
 KR 2002077636 A 20021012 (200319) H01L021-304
 US 2003022499 A1 20030130 (200319) H01L021-302
 US 6540935 B2 20030401 (200324) C09K013-00
 US 2003148616 A1 20030807 (200358) C03C025-68
 SG 102648 A1 20040326 (200427) C09K013-00
 TW 573001 A 20040121 (200453) C09K003-14
 KR 459696 B 20041203 (200525) H01L021-304
 US 6914001 B2 20050705 (200544) H01L021-302
 ADT DE 10160174 A1 DE 2001-10160174 20011207; JP 2002313760 A JP 2001-392645
 20011225; KR 2002077636 A KR 2001-25873 20010511; US 2003022499 A1 US
 2001-826169 20010405; US 6540935 B2 US 2001-826169 20010405; US 2003148616
 A1 Div ex US 2001-826169 20010405, US 2003-351539 20030127; SG 102648 A1
 SG 2001-7788 20011212; TW 573001 A TW 2001-129490 20011129; KR 459696 B KR
 2001-25873 20010511; US 6914001 B2 Div ex US 2001-826169 20010405, US
 2003-351539 20030127
 FDT US 2003148616 A1 Div ex US 6540935; KR 459696 B Previous Publ. KR
 2002077636; US 6914001 B2 Div ex US 6540935
 PRAI US 2001-826169 20010405; US 2003-351539 20030127
 IC ICM C03C025-68; C09G001-02; C09K003-14; C09K013-00; H01L021-302;
 H01L021-304
 ICS B24B037-00; B24B057-02; H01L021-461
 AB DE 10160174 A UPAB: 20030320
NOVELTY - Chemical/mechanical polishing
 slurry comprises an aqueous solution containing abrasive particles and 2 different passivating agents.
 USE - The slurry is used in rotary chemical/mechanical polishing (CMP) with a polishing pad; and in shallow trench insulation, comprising coating a semiconductor substrate with cushion oxide and silicon nitride (SiN), making trenches through these layers into the substrate, forming an insulating oxide film over the trenches and removing the SiN layer and this film down to the plane of the SiN layer by CMP (all claimed). The CMP is used in making microelectronic devices.
 ADVANTAGE - The oxide/silicon nitride selectivity of the aqueous solution is not less than 50:1 (claimed), which is better than usual.
 DESCRIPTION OF DRAWING(S) - The drawing shows the chemical/mechanical polishing (CMP) stage of the process flow diagram. (Drawing includes non-English language text).
 Contact surface of wafer with polishing pad 802
 Supply CMP slurry containing abrasive
 and the first and second passivating agents 803
 Rotate surface of wafer relative to surface of polishing pad to remove oxide coating 804
 Dwg.8/9

FS CPI EPI GMPI
 FA AB; GI; DCN
 MC CPI: A11-B05; A12-E04; A12-E07C; E05-A; E05-G09C; E10-A09B4; E10-A09B5;
 E10-A22; E10-C02F; E10-C04; E31-K05D; E31-K05E; E31-P03; E31-P06D;
 E34-C02; E34-E; E35-G; E35-K02; E35-L; G02-A05B; L02-F; L04-C27
 EPI: U11-A10; U11-C06A1A

L39 ANSWER 23 OF 34 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2001:338649 HCAPLUS
 DN 134:341709
 ED Entered STN: 11 May 2001
 TI Organic additives for chemical-mechanical polishing
 slurries for Ta barrier layers in integrated circuits
 IN Sahota, Kashmir S.; Schonauer, Diana M.; Avanzino, Steven C.
 PA Advanced Micro Devices, Inc., USA
 SO PCT Int. Appl., 38 pp.
 CODEN: PIXXD2
 DT Patent
 LA English
 IC ICM C09G001-02
 CC 42-13 (Coatings, Inks, and Related Products)
 Section cross-reference(s): 76

FAN.CNT 3

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|--|------|----------|-----------------|----------|
| PI | WO 2001032794 | A1 | 20010510 | WO 2000-US30354 | 20001103 |
| | W: CN, JP, KR, SG RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR | | | | |
| | US 2002005504 | A1 | 20020117 | US 1999-434146 | 19991104 |
| | US 6503418 | B2 | 20030107 | | |
| | EP 1246879 | A1 | 20021009 | EP 2000-976902 | 20001103 |
| | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR | | | | |
| | JP 2003514374 | T2 | 20030415 | JP 2001-535479 | 20001103 |
| PRAI | US 1999-434146 | A | 19991104 | | |
| | WO 2000-US30354 | W | 20001103 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|---------------|-------|------------------------------------|
| WO 2001032794 | ICM | C09G001-02 |
| WO 2001032794 | ECLA | C09G001/02; C09K003/14D2 |
| US 2002005504 | NCL | 252/079.100 |
| | ECLA | C09G001/02; C09K003/14D2 |

AB A Ta barrier slurry for Chemical-Mech. Polishing (CMP) during copper metalization contains an organic additive which suppresses formation of ppt. and copper staining. The organic additive is chosen from a class of compds. which form multiple strong adsorbent bonds to the surface of silica or copper, which provide a high degree of surface coverage onto the reactive species, thereby occupying potential reaction sites, and which are sized to sterically hinder the collisions between two reactant mols. which result in new bond formation.

ST org additive polishing slurry integrated circuit

IT Surfactants

(nonionic; organic additives for chemical-mech. polishing
 slurries for Ta barrier layers in integrated circuits)

IT Abrasives

Corrosion inhibitors

Integrated circuits

Polishing materials

(organic additives for chemical-mech. polishing slurries
for Ta barrier layers in integrated circuits)

IT Amines, uses

Polyoxyalkylenes, uses

RL: MOA (Modifier or additive use); USES (Uses)

(organic additives for chemical-mech. polishing slurries
for Ta barrier layers in integrated circuits)

IT 7631-86-9, Silica, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(abrasive; organic additives for chemical-mech. polishing
slurries for Ta barrier layers in integrated circuits)

IT 50-70-4, Sorbitol, uses 56-81-5, Glycerol, uses 107-21-1, Ethylene
glycol, uses 111-46-6, Di(ethylene glycol), uses 9002-89-5, Polyvinyl
alcohol 9002-92-0, Polyoxyethylene lauryl ether 9003-05-8,
Polyacrylamide 9004-95-9, Polyoxyethylene cetyl ether 9016-45-9,
Nonylphenol polyethylene oxide 9063-89-2, Poly(ethylene oxide)
octylphenol ether 25067-34-9, Ethylene-vinyl alcohol copolymer
25213-24-5, Vinyl alcohol-vinyl acetate copolymer 25322-68-3,
Poly(ethylene glycol) 25791-96-2 31694-55-0, Polyethylene glycol
glycerol ether 156048-32-7, Dimethylsilanediol-ethylene oxide co-polymer

RL: MOA (Modifier or additive use); USES (Uses)

(organic additives for chemical-mech. polishing slurries
for Ta barrier layers in integrated circuits)

RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Gomez, J; US 5897375 A 1999

(2) Higuchi, M; US 5770095 A 1998 HCAPLUS

L39 ANSWER 24 OF 34 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2001:469560 HCAPLUS

DN 135:63058

ED Entered STN: 29 Jun 2001

TI Cleaning compositions for chemical mechanical
polishing slurry of semiconductors

IN Yamana, Masahide; Shudo, Shinsei

PA Advantech K. K., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01L021-304

ICS B24B037-00; C11D001-00; C11D003-14

CC 46-6 (Surface Active Agents and Detergents)

Section cross-reference(s): 76

FAN.CNT 1

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------------|-------|----------|-----------------|----------|
| ----- | ----- | ----- | ----- | ----- |
| PI JP 2001176825 | A2 | 20010629 | JP 1999-356160 | 19991215 |
| PRAI JP 1999-356160 | | 19991215 | | |

CLASS

PATENT NO. CLASS PATENT FAMILY CLASSIFICATION CODES

----- ----- ----- ----- -----

JP 2001176825 ICM H01L021-304

ICS B24B037-00; C11D001-00; C11D003-14

AB The title compns. contain 1-70% abrasive particles
free from alkali metal ions (e.g., silica with average diameter 25
μm) and 1-50% nonionic surfactants (e.g.,
polyoxyethylene monooleate, polyoxyethylene propylene glycol,
polyoxyethylene monostearate) as aqueous emulsions.

ST semiconductor chem mech polishing

slurry cleaning compn; silica abrasive
 particle semiconductor polishing slurry cleaning;
 nonionic surfactant semiconductor polishing
 slurry cleaning
 IT Emulsions
 Scouring agents
 Semiconductor materials
 (cleaning compns. for chemical mech.
 polishing slurry of semiconductors)
 IT Surfactants
 (nonionic; cleaning compns. for chemical
 mech. polishing slurry of semiconductors)
 IT Polishing
 (of semiconductors; cleaning compns. for chemical
 mech. polishing slurry of semiconductors)
 IT Abrasives
 (particles; cleaning compns. for chemical mech
 polishing slurry of semiconductors)
 IT 7631-86-9, Silica, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (abrasive particles; cleaning compns. for
 chemical mech. polishing slurry of
 semiconductors)
 IT 9003-11-6, Polyoxyethylene propylene glycol ether 9004-96-0,
 Polyoxyethylene monooleate 9004-99-3, Polyoxyethylene monostearate
 RL: TEM (Technical or engineered material use); USES (Uses)
 (nonionic surfactants; cleaning compns.
 for chemical mech. polishing slurry
 of semiconductors)
 IT 7631-86-9, Silica, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (abrasive particles; cleaning compns. for
 chemical mech. polishing slurry of
 semiconductors)
 RN 7631-86-9 HCPLUS
 CN Silica (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

L39 ANSWER 25 OF 34 HCPLUS COPYRIGHT 2005 ACS on STN
 AN 2001:557817 HCPLUS
 DN 135:115843
 ED Entered STN: 03 Aug 2001
 TI Polishing compositions for magnetic disks
 IN Shemo, David M.; Rader, W. Scott; Owaki, Toshiki
 PA Fujimi America Inc., USA
 SO Brit. UK Pat. Appl., 36 pp.
 CODEN: BAXXDU
 DT Patent
 LA English
 IC ICM C09G001-02
 CC 77-8 (Magnetic Phenomena)
 FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----|------------|------|----------|-----------------|----------|
| PI | GB 2354525 | A1 | 20010328 | GB 2000-23101 | 20000920 |
| | GB 2354525 | B2 | 20031022 | | |

| | | | | |
|---------------------|----|----------|----------------|----------|
| US 6258140 | B1 | 20010710 | US 1999-404993 | 19990927 |
| CN 1289811 | A | 20010404 | CN 2000-131713 | 20000927 |
| CN 1134521 | B | 20040114 | | |
| JP 2001155332 | A2 | 20010608 | JP 2000-294874 | 20000927 |
| PRAI US 1999-404993 | A | 19990927 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|------------|-------|------------------------------------|
|------------|-------|------------------------------------|

| | | |
|------------|------|--|
| GB 2354525 | ICM | C09G001-02 |
| GB 2354525 | ECLA | C09G001/02; C09K003/14D2; G11B005/84B |
| US 6258140 | NCL | 051/308.000; 106/003.000; 510/165.000; 510/167.000 |
| | ECLA | C09G001/02; C09K003/14D2; G11B005/84B |

AB A polishing composition for polishing a memory hard disk having a high stock removal rate and capable of providing a polished surface having a small surface roughness and preventing formation of microprotrusions, micropits or other surface defects, comprises the following components: (a) 0.1-50 wt% in the total amount of the polishing composition, of ≥ 1 abrasive particles selected from silicon dioxide, aluminum oxide, cerium oxide, zirconium oxide, titanium oxide, silicon nitride and manganese dioxide; (b) 0.0001-3.0 wt% of ≥ 1 polishing resistance-reducing agent selected from a surfactant, a water-soluble polymer and a polyelectrolyte, (c) 0.001-40 wt% of ≥ 1 polishing accelerator selected from an inorg. acid, an organic acid and their aluminum, iron, nickel and cobalt salts (such as aluminum nitrate, ascorbic acid, sulfuric acid), and (d) water.

ST magnetic disk polishing compn; silicon dioxide abrasive polishing; polishing resistance reducing agent; accelerator polishing

IT Salts, uses

RL: TEM (Technical or engineered material use); USES (Uses) (Al, Fe, Ni, Co; polishing compns. for magnetic disks)

IT Acrylic polymers, uses

RL: TEM (Technical or engineered material use); USES (Uses) (ammonium salt; polishing compns. for magnetic disks)

IT Surfactants

(anionic; polishing compns. for magnetic disks)

IT Surfactants

(cationic; polishing compns. for magnetic disks)

IT Amines, uses

RL: TEM (Technical or engineered material use); USES (Uses) (coco alkyl, ethoxylated, quaternary ammonium chloride; polishing compns. for magnetic disks)

IT Amines, uses

RL: TEM (Technical or engineered material use); USES (Uses) (ethoxylated, quaternary ammonium salt; polishing compns. for magnetic disks)

IT Surfactants

(nonionic; polishing compns. for magnetic disks)

IT Sulfonic acids, uses

RL: TEM (Technical or engineered material use); USES (Uses) (polishing accelerator; polishing compns. for magnetic disks)

IT Abrasives

Magnetic disks

Polishing

Polishing materials

Polyelectrolytes

Slurries

(polishing compns. for magnetic disks)

IT Polyoxyalkylenes, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(polishing compns. for magnetic disks)

IT Amines, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(tallow alkyl, ethoxylated; polishing compns. for
magnetic disks)

IT 7631-86-9, Colloidal silica, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(colloidal; polishing compns. for magnetic disks)IT 50-21-5, Lactic acid, uses 50-81-7, Ascorbic acid, uses 56-40-6,
Glycine, uses 56-86-0, Glutamic acid, uses 77-92-9, Citric acid, uses
79-14-1, Glycolic acid, uses 87-69-4, Tartaric acid, uses 90-64-2,
Mandelic acid 110-15-6, Succinic acid, uses 141-82-2, Malonic acid,
uses 473-81-4, Glyceric acid 526-95-4, Gluconic acid 547-67-1,
Nickel oxalate 814-87-9, Aluminum oxalate 2338-05-8, Iron citrate
6915-15-7, Malic acid 7050-19-3, Ammonium iron citrate 7446-70-0,
Aluminum chloride, uses 7601-90-3, Perchloric acid, uses 7646-79-9,
Cobalt chloride, uses 7647-01-0, Hydrochloric acid, uses 7664-38-2,
Phosphoric acid, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric
acid, uses 7705-08-0, Iron chloride, uses 7718-54-9, Nickel chloride,
uses 7784-25-0, Ammonium aluminum sulfate 7786-81-4, Nickel sulfate
10043-01-3, Aluminum sulfate 10043-35-3, Boric acid, uses 10045-89-3,
Ammonium iron sulfate 10124-43-3, Cobalt sulfate 10124-49-9, Iron
sulfate 10141-05-6, Cobalt nitrate 13138-45-9, Nickel nitrate
13473-90-0, Aluminum nitrate 13637-71-3, Nickel perchlorate
14013-86-6, Iron nitrate 14452-39-2, Aluminumperchlorate 19297-92-8,
Ammonium iron oxalate 22605-92-1, Nickel citrate 31142-56-0, Aluminum
citrate 38023-20-0, Iron hydroxide-perchlorate (Fe(OH)(ClO₄)₂)
49599-05-5, Ammonium aluminum citrateRL: TEM (Technical or engineered material use); USES (Uses)
(polishing accelerator; polishing compns.

for magnetic disks)

IT 60-00-4D, Ethylenediaminetetraacetic acid, Fe, Ni, Co complex, uses
67-42-5D, Fe, Ni, Co complex 67-43-6D, Diethylenetriaminepentaacetic
acid, Fe, Ni, Co complex 93-62-9D, Fe, Ni, Co complex 139-13-9D,
Nitrilotriacetic acid, Fe, Ni, Co complex 150-25-4D, Dihydroxyethyl
glycine, Fe, Ni, Co complex 150-39-0D, Hydroxyethylethylenediaminetriace
tic acid, Fe, Ni, Co complex 869-52-3D, Fe, Ni, Co complex 1306-38-3,
Cerium oxide, uses 1313-13-9, Manganese dioxide, uses 1314-23-4,
Zirconium oxide, uses 1344-28-1, Aluminum oxide, uses 4408-81-5D,
Propylenediaminetetraacetic acid, Fe, Ni, Co complex 9002-89-5,
Polyvinyl alcohol 9003-01-4, Polyacrylic acid 12033-89-5, Silicon
nitride, uses 13463-67-7, Titanium oxide, uses 25322-68-3,
Polyethylene oxide 162362-34-7RL: TEM (Technical or engineered material use); USES (Uses)
(polishing compns. for magnetic disks)

L39 ANSWER 26 OF 34 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2001-168335 [17] WPIX

DNN N2001-121419 DNC C2001-050197

TI Chemical-mechanical polishing slurry

used in semiconductor device planarization has particles uniformly
dispersed in an aqueous medium with specified surface area, an aggregate
size distribution and an aggregate diameter.

DC A25 A26 A85 L03 M14 P61 U11

IN BURKE, P A; LACK, C D; LUO, Q; SACHAN, V; THOMAS, T M; YE, Q C; YE, Q

PA (RODE-N) RODEL HOLDINGS INC
 CYC 31
 PI WO 2001002134 A1 20010111 (200117)* EN 33 B24B001-00
 RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
 W: CN JP KR SG
 EP 1177068 A1 20020206 (200218) EN B24B001-00
 R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
 RO SE SI
 TW 452523 A 20010901 (200240) B24B001-00
 US 6447373 B1 20020910 (200263) B24B001-00
 KR 2002035826 A 20020515 (200273) H01L021-304
 JP 2003503862 W 20030128 (200309) 34 H01L021-304
 ADT WO 2001002134 A1 WO 2000-US17046 20000621; EP 1177068 A1 EP 2000-943003
 20000621, WO 2000-US17046 20000621; TW 452523 A TW 2000-112525 20000626;
 US 6447373 B1 Provisional US 1999-142326P 19990703, US 2000-598377
 20000621; KR 2002035826 A KR 2002-700019 20020102; JP 2003503862 W WO
 2000-US17046 20000621, JP 2001-507608 20000621
 FDT EP 1177068 A1 Based on WO 2001002134; JP 2003503862 W Based on WO
 2001002134
 PRAI US 1999-142326P 19990703; US 2000-598377 20000621
 IC ICM B24B001-00; H01L021-304
 ICS B24B037-00; B24D003-34; C09K003-14; C09K013-00; H01L021-00;
 H01L021-44
 AB WO 200102134 A UPAB: 20010328

NOVELTY - Chemical-mechanical polishing
 slurry has particles uniformly dispersed in an aqueous medium with a surface area of 40-430 m²/g, aggregate size distribution less than 1 μm, mean aggregate diameter less than 0.4 μm, and contains at least one ionic species which prevents a force sufficient to repel and overcome the van der Waals forces between particles. The particles form stage 1 agglomerates greater than 1 μm.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of **chemical-mechanical polishing** of a metal layer of a substrate by **chemical mechanical polishing** a metal layer with the inventive **slurry** comprising particles dispersible in an aqueous medium. The medium has a static etch rate with respect to the metal layer of less than 75 Angstrom /min.

USE - The **slurry** is used in **chemical-mechanical polishing** of a metal layer of a substrate, preferably in semiconductor device planarization, memory disk polishing, and optics polishing. It can be used in polishing dielectrics, including low k (dielectric constant) dielectrics, e.g. porous silica, or organic low k dielectrics, e.g. fluoro polymers or copolymers.

ADVANTAGE - The method provides an effective **polishing** to metal layers at desired **polishing** rates while minimizing surface imperfections and defects. The **slurries** have a low static etch rate and are metastable due to reversible formation of types of agglomerates. The agglomerates will not cause unacceptable **polishing** defects and will de-agglomerate with simple agitation.

Dwg.0/6

FS CPI EPI GMPI
 FA AB
 MC CPI: A12-W12C; L04-C26; M14-A
 EPI: U11-C06A1A

L39 ANSWER 27 OF 34 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2001-158580 [16] WPIX
 DNN N2001-115522 DNC C2001-046981

TI Manufacture of a semiconductor device on a wafer involves chemically treating the wafer by immersion in a solution and/or double sided scrubbing of the wafer with the solution.

DC L03 U11

IN AVANZINO, S C; SCHONAUER, D M; YANG, K
PA (ADMI) ADVANCED MICRO DEVICES INC

CYC 1

PI US 6177349 B1 20010123 (200116)* 7 H01L021-44

ADT US 6177349 B1 US 1998-206169 19981207

PRAI US 1998-206169 19981207

IC ICM H01L021-44

AB US 6177349 B UPAB: 20010323

NOVELTY - A semiconductor device is manufactured on a wafer by chemically treating the wafer surface with a solution containing ammonium fluoride, diammonium hydrogen citrate, triammonium citrate, a surfactant, and water by immersing the wafer in the solution and/or double sided brush scrubbing the wafer with the solution.

DETAILED DESCRIPTION - Manufacture of a semiconductor device on a wafer involves:

(a) forming a copper (Cu) or Cu alloy interconnection pattern comprising a dense array of spaced apart Cu or Cu alloy lines bordering an open dielectric field on a surface of the wafer; and

(b) chemically treating the wafer surface with a solution containing ammonium fluoride, diammonium hydrogen citrate, triammonium citrate, a surfactant, and water by immersing the wafer in the solution and/or double sided brush scrubbing the wafer with the solution.

USE - Manufacturing high speed integrated circuits having submicron features and high aspect ratio openings such as semiconductor devices with a design rule of 0.18 microns and under.

ADVANTAGE - Enables the formation of reliable Cu and/or Cu alloy interconnection while eliminating or substantially reducing the formation and/or growth of dendrites emanating from Cu or Cu alloy lines and substantially removing residual slurry particles in an efficient, cost effective manner.

Dwg.0/1

FS CPI EPI

FA AB

MC CPI: L04-C11C; L04-C26
EPI: U11-C05E1; U11-C06A1A

L39 ANSWER 28 OF 34 HCPLUS COPYRIGHT 2005 ACS on STN

AN 2000:291176 HCPLUS

DN 132:302004

ED Entered STN: 05 May 2000

TI Chemical mechanical polishing slurry system having an activator solution

IN Mahulikar, Deepak

PA Arch Specialty Chemicals, Inc., USA

SO PCT Int. Appl., 21 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM C09K003-14

ICS C09G001-02; B24B001-00

CC 76-3 (Electric Phenomena)

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----|---------------|------|----------|-----------------|----------|
| PI | WO 2000024842 | A1 | 20000504 | WO 1999-US24864 | 19991022 |
| | W: JP, KR, SG | | | | |

RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

EP 1124912 A1 20010822 EP 1999-955147 19991022
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI

JP 2002528903 T2 20020903 JP 2000-578398 19991022

US 6447563 B1 20020910 US 1999-425358 19991022

PRAI US 1998-105366P P 19981023
WO 1999-US24864 W 19991022

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|---------------|-------|---|
| WO 2000024842 | ICM | C09K003-14 |
| | ICS | C09G001-02; B24B001-00 |
| WO 2000024842 | ECLA | C09G001/02; C09K003/14D2 |
| US 6447563 | NCL | 051/309.000; 051/307.000; 051/308.000; 106/003.000; 252/079.200; 252/079.300; 252/079.400; 438/692.000; 438/693.000 |
| | ECLA | C09G001/02; C09K003/14D2 |

AB This invention relates to a **CMP slurry** system for use in semiconductor device fabrication. The **slurry** system comprises 2 parts. The 1st part is a generic dispersion that contains only an **abrasive** and, optionally, a surfactant and a stabilizing agent. The generic dispersion can be used for **polishing** metals as well as interlayer dielectrics. The 2nd part is a novel activator solution comprising ≥ 2 components selected from: an oxidizer, acids, amines, chelating agents, F-containing compds., corrosion inhibitors, buffering agents, surfactants, biol. agents, and their mixts.

ST chem mech **polishing slurry** activator soln;
semiconductor device fabrication **CMP slurry**

IT Quaternary ammonium compounds, processes

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(alkylbenzyldimethyl, chlorides; chemical mech. **polishing slurry** system having activator solution containing)

IT Surfactants
(amphoteric; chemical mech. **polishing slurry** system having activator solution containing)

IT Surfactants
(anionic; chemical mech. **polishing slurry** system having activator solution containing)

IT Surfactants
(cationic; chemical mech. **polishing slurry** system having activator solution containing)

IT Abrasives
Buffers
Chelating agents
Corrosion inhibitors
Oxidizing agents
Stabilizing agents
Surfactants
(chemical mech. **polishing slurry** system having activator solution containing)

IT Acids, processes
Alkali metal fluorides
Alkaline earth fluorides
Amines, processes
Carboxylic acids, processes
Tannins
RL: PEP (Physical, engineering or chemical process); TEM (Technical or

engineered material use); PROC (Process); USES (Uses)
 (chemical mech. polishing slurry system having
 activator solution containing)

IT Semiconductor device fabrication
 Slurries
 (chemical mech. polishing slurry system having
 activator solution for semiconductor device fabrication)

IT Polishing
 (chemical-mech.; chemical mech. polishing slurry system
 having activator solution for semiconductor device fabrication)

IT Electric insulators
 (interlayer; slurry system having activator solution for
 chemical-mech. polishing of)

IT Surfactants
 (nonionic; chemical mech. polishing slurry
 system having activator solution containing)

IT 50-21-5, Lactic acid, processes 56-34-8, Tetraethylammonium chloride
 60-00-4, Ethylenediaminetetraacetic acid, processes 64-18-6, Formic
 acid, processes 64-19-7, Acetic acid, processes 67-43-6,
 Diethylenetriaminepentaacetic acid 75-57-0, Tetramethylammonium chloride
 75-59-2, Tetramethylammonium hydroxide 77-92-9, Citric acid,
 processes 79-09-4, Propanoic acid, processes 87-69-4, Tartaric acid,
 processes 88-99-3, Phthalic acid, processes 95-14-7, 1H-Benzotriazole
 102-71-6, Triethanolamine, processes 103-76-4, 1-Piperazineethanol
 103-83-3D, Benzylidimethylamine, alkyl ammonium hydroxide derivs.
 107-92-6, Butanoic acid, processes 109-52-4, Pentanoic acid, processes
 111-14-8, Heptanoic acid 111-42-2, Diethanolamine, processes 112-05-0,
 Nonanoic acid 124-07-2, Octanoic acid, processes 136-85-6,
 6-Tolyltriazole 139-13-9, Nitrilotriacetic acid 141-43-5,
 Monoethanolamine, processes 142-62-1, Hexanoic acid, processes
 149-91-7, Gallic acid, processes 150-39-0, N-
 Hydroxyethylmethylenediaminetriacetic acid 373-68-2, Tetramethylammonium
 fluoride 409-21-2, Silicon carbide (SiC), processes 526-95-4, Gluconic
 acid 627-74-7 929-06-6, Diethyleneglycolamine 1306-38-3, Ceria,
 processes 1310-58-3, Potassium hydroxide, processes 1314-23-4,
 Zirconium oxide, processes 1332-29-2, Tin oxide 1332-37-2, Iron oxide,
 processes 1336-21-6, Ammonium hydroxide ((NH4)(OH)) 1341-49-7,
 Ammonium bifluoride 1344-28-1, Alumina, processes 3811-73-2, Sodium
 pyrithione 4499-86-9, Tetrapropylammonium hydroxide 5810-42-4,
 Tetrapropylammonium chloride 6915-15-7, Malic acid 7647-01-0,
 Hydrochloric acid, processes 7664-38-2, Phosphoric acid, processes
 7664-39-3, Hydrofluoric acid, processes 7664-93-9, Sulfuric acid,
 processes 7681-52-9, Sodium hypochlorite 7697-37-2, Nitric acid,
 processes 7758-19-2, Sodium chlorite 7803-49-8, Hydroxylamine,
 processes 12033-89-5, Silicon nitride, processes 12125-01-8, Ammonium
 fluoride 13463-67-7, Titanium dioxide, processes 35914-36-4,
 Pyrogallol carboxylic acid 57178-78-6 68444-11-1 123155-80-6
 130397-22-7, Perfluoric acid 152275-68-8, 1-
 (2,3,5-Dicarboxypropyl)benzotriazole
 RL: PEP (Physical, engineering or chemical process); TEM (Technical or
 engineered material use); PROC (Process); USES (Uses)
 (chemical mech. polishing slurry system having
 activator solution containing)

IT 7631-86-9, Silica, processes
 RL: PEP (Physical, engineering or chemical process); TEM (Technical or
 engineered material use); PROC (Process); USES (Uses)
 (colloidal; chemical mech. polishing slurry system
 having activator solution containing)

IT 7429-90-5, Aluminum, processes 7440-25-7, Tantalum, processes
 7440-32-6, Titanium, processes 7440-33-7, Tungsten, processes

7440-50-8, Copper, processes

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (slurry system having activator solution for chemical-mech.
 polishing of)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
 RE

- (1) Feller; US 5700383 A 1997 HCPLUS
- (2) Kaufman; US 5783489 A 1998
- (3) Kido; US 5800577 A 1998 HCPLUS
- (4) Neville; US 5527423 A 1996 HCPLUS
- (5) Sandusky; US 5266088 A 1998 HCPLUS
- (6) Yamada; US 5366542 A 1994 HCPLUS

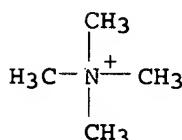
IT 75-59-2, Tetramethylammonium hydroxide 1336-21-6,

Ammonium hydroxide ((NH4)(OH))

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (chemical mech. polishing slurry system having
 activator solution containing)

RN 75-59-2 HCPLUS

CN Methanaminium, N,N,N-trimethyl-, hydroxide (9CI) (CA INDEX NAME)



● OH⁻

RN 1336-21-6 HCPLUS

CN Ammonium hydroxide ((NH4)(OH)) (9CI) (CA INDEX NAME)

H₄N—OH

L39 ANSWER 29 OF 34 HCPLUS COPYRIGHT 2005 ACS on STN

AN 2000:803851 HCPLUS

DN 133:358135

ED Entered STN: 15 Nov 2000

TI Auxiliary agents and compositions containing water-soluble polymers for chemical-mechanical polishing of semiconductor substrates or devices

IN Ishibashi, Yoichi; Sowa, Toshiki; Fukumoto, Yasuhisa

PA Kao Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C08L101-14

ICS B24B057-02; C08K003-00; C08L033-02; C08L071-02; C09K003-14;
 H01L021-304

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 38

FAN.CNT 1

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------------|------|----------|-----------------|----------|
| PI JP 2000313815 | A2 | 20001114 | JP 1999-124498 | 19990430 |
| PRAI JP 1999-124498 | | 19990430 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|------------|-------|------------------------------------|
|------------|-------|------------------------------------|

| | | |
|---------------|-----|--|
| JP 2000313815 | ICM | C08L101-14 |
| | ICS | B24B057-02; C08K003-00; C08L033-02; C08L071-02; C09K003-14; H01L021-304 |

AB The agents contain water-soluble polymers which show ≥50% adsorption (at 25°) on the abrasive particles when 0.05 weight part of the polymers are added to 100 weight parts aqueous slurry containing 10 weight% abrasive particles having primary particle size 10-100 nm. Preferably, the polymers are polyoxyalkylenes or vinyl copolymers. High accuracy and good surface appearance are achieved by high-speed polishing of semiconductor substrates or devices with the compns. containing the polymers above and abrasives.

ST semiconductor chem mech polishing
polyoxyalkylene; water soluble vinyl polymer abrasive
semiconductor

IT Abrasives

Semiconductor device fabrication
(abrasive compns. containing water-soluble polymers for
chemical-mech. polishing of semiconductor
substrates or devices)

IT Polyoxyalkylenes, properties

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(abrasive compns. containing water-soluble polymers for
chemical-mech. polishing of semiconductor
substrates or devices)

IT Polyoxyalkylenes, properties

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(acrylic; abrasive compns. containing water-soluble
polymers for chemical-mech. polishing of
semiconductor substrates or devices)

IT Polishing

(chemical-mech.; abrasive compns.
containing water-soluble polymers for chemical-mech.
polishing of semiconductor substrates or devices)

IT 305383-98-6P 305383-99-7P 305384-01-4P 305384-02-5P 305384-04-7P
305384-06-9P 305384-08-1P 305807-95-8P, Ethylene

oxide-propylene oxide block copolymer

monoacrylate-methacrylic acid graft copolymer ammonium salt 312314-72-0P
312314-75-3P 312746-76-2P 312746-77-3P 312746-82-0P

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)

(abrasive compns. containing water-soluble polymers for
chemical-mech. polishing of semiconductor
substrates or devices)

IT 25322-68-3, Polyethylene glycol 106392-12-5, Ethylene

oxide-propylene oxide block copolymer

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(abrasive compns. containing water-soluble polymers for
chemical-mech. polishing of semiconductor

substrates or devices)

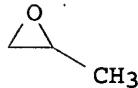
IT 7631-86-9, Silica, uses 11129-18-3, Cerium oxide
 RL: TEM (Technical or engineered material use); USES (Uses)
 (abrasive; abrasive compns. containing
 water-soluble polymers for chemical-mech.
 polishing of semiconductor substrates or devices)

IT 106392-12-5, Ethylene oxide-propylene
 oxide block copolymer
 RL: PRP (Properties); TEM (Technical or engineered material use); USES
 (Uses)
 (abrasive compns. containing water-soluble polymers for
 chemical-mech. polishing of semiconductor
 substrates or devices)

RN 106392-12-5 HCPLUS

CN Oxirane, methyl-, polymer with oxirane, block (9CI) (CA INDEX NAME)

CM 1

CRN 75-56-9
 CMF C3 H6 O

CM 2

CRN 75-21-8
 CMF C2 H4 O

IT 7631-86-9, Silica, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (abrasive; abrasive compns. containing
 water-soluble polymers for chemical-mech.
 polishing of semiconductor substrates or devices)

RN 7631-86-9 HCPLUS

CN Silica (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

L39 ANSWER 30 OF 34 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2000-587095 [55] WPIX
 DNN N2000-434529 DNC C2000-174953
 TI Chemical mechanical polishing of low
 dielectric constant polymer surface of integrated circuit wafer, utilizes
 slurry comprising fine metal oxide particles uniformly dispersed
 in stable aqueous medium.

DC A85 L03 U11
 IN HOSALI, S D; SACHAN, V

PA (HOSA-I) HOSALI S D; (SACH-I) SACHAN V; (RODE-N) RODEL HOLDINGS INC
 CYC 24
 PI WO 2000049647 A1 20000824 (200055)* EN 18 H01L021-302
 RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
 W: CN JP KR SG
 US 2001013507 A1 20010816 (200149) C23F001-00
 EP 1171906 A1 20020116 (200207) EN H01L021-302
 R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
 KR 2001111261 A 20011217 (200238) H01L021-304
 JP 2002537652 W 20021105 (200304) 16 H01L021-304
 ADT WO 2000049647 A1 WO 2000-US3893 20000216; US 2001013507 A1 Provisional US
 1999-120567P 19990218, CIP of US 2000-505042 20000216, US 2000-742853
 20001221; EP 1171906 A1 EP 2000-913478 20000216, WO 2000-US3893 20000216;
 KR 2001111261 A KR 2001-710397 20010816; JP 2002537652 W JP 2000-600297
 20000216, WO 2000-US3893 20000216
 FDT EP 1171906 A1 Based on WO 2000049647; JP 2002537652 W Based on WO
 2000049647
 PRAI US 1999-120567P 19990218; US 2000-505042 20000216;
 US 2000-742853 20001221
 IC ICM C23F001-00; H01L021-302; H01L021-304
 ICS B24B037-00; C09K003-14; H01B013-00
 AB WO 200049647 A UPAB: 20001102
 NOVELTY - A low dielectric constant polymer surface of an integrated
 circuit (IC) wafer is chemically and mechanically
 polished with a chemical mechanical
 polishing slurry comprising a colloidally stable
 dispersion of metal oxide particles. The particles have medium having
 40-430 m²/g surface area, less than 1 μm aggregate size distribution,
 and less than 0.4 μm mean aggregate diameter.
 USE - The method is useful in chemical mechanical
 polishing a low dielectric constant polymer surface of an
 integrated circuit wafer or semiconductor devices. It is useful in
 chemical mechanical planarization to remove uneven inter-level dielectric
 (ILD) topography, layers of material, surface defects including scratches,
 roughness, or contaminant particles, e.g. dirt or dust.
 ADVANTAGE - The utilization of the slurry provides an
 effective polishing while minimizing surface imperfections and
 defects.
 Dwg.0/0
 FS CPI EPI
 FA AB
 MC CPI: A09-A03; A11-C04; A12-E07C; L04-B04; L04-C07; L04-C12E
 EPI: U11-C05B9A; U11-C05D1; U11-C06A1A
 L39 ANSWER 31 OF 34 HCAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 2
 AN 2000:147946 HCAPLUS
 DN 132:230589
 ED Entered STN: 05 Mar 2000
 TI Surfactant based alumina slurries for copper CMP
 AU Babel, Ashok K.; Mackay, Raymond A.
 CS Center for Advanced Materials Processing, Clarkson University, Potsdam,
 NY, 13699, USA
 SO Materials Research Society Symposium Proceedings (2000),
 566 (Chemical-Mechanical Polishing--Fundamentals and Challenges), 135-142
 CODEN: MRSPDH; ISSN: 0272-9172
 PB Materials Research Society
 DT Journal
 LA English
 CC 76-14 (Electric Phenomena)
 Section cross-reference(s): 56, 57

AB The polishing of copper and examination of the polished surfaces were carried out with surfactant based alumina slurries to yield interesting results. Contrary to our expectation and previously reported research, some of the surfactant based alumina slurries resulted in higher copper polish rates when compared to the control. Of the nonionic surfactants, BrijR 35 was overall the most effective in both acidic and basic media. Ionics were effective at the pH for the appropriate charge type. For the range of surfactants studied, polish rates correlated with the HLB of the nonionic surfactants. The Hydrophile-Lipophile Balance (HLB) is related to the solubility of the surfactant, with higher number corresponding to increased water dispersibility. The surfactant BrijR 35, with the nonionic composition polyoxyethylene(23) lauryl ether, resulted in a dramatic improvement in the average surface uniformity when compared with the control at pH 2, and Sodium Dodecyl Sulfate produced even greater uniformity. Addnl., the effect of BrijR 35 surfactant was maintained with change in abrasive size, pad and polishing tool. In order to insure that surfactants are compatible with the chemical reagents contained in the com. slurries, two chemistries (ferric nitrate and hydrogen peroxide) were employed to test the efficiency of the selected surfactants in their presence. The results showed that the effect of surfactant on stability and removal rate is not influenced by the presence of the chems. Preliminary results indicate that surfactants can have a beneficial effect on both defects and post polish clean.

ST aluminum slurry surfactant abrasive copper CMP

IT Slurries

(alumina; surfactant based alumina slurries for copper CMP)

IT Surfactants

(in abrasive slurry; surfactant based alumina slurries for copper CMP)

IT Surfactants

(nonionic; surfactant based alumina slurries for copper CMP)

IT Abrasives

(slurry; surfactant based alumina slurries for copper CMP)

IT Hydrophile-lipophile balance value

(surfactant based alumina slurries for copper CMP)

IT 1344-28-1, Alumina, properties

RL: NUU (Other use, unclassified); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(slurry; surfactant based alumina slurries for copper CMP)

IT 7440-50-8, Copper, properties 7722-84-1, Hydrogen peroxide, properties

10421-48-4, Ferric nitrate

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)

(surfactant based alumina slurries for copper CMP)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Adler, J; Mat Res Soc Symp Proc 1998, V501, P387 HCAPLUS

(2) Anon; Private Communication from BJ Palla, D O Shah, M Bielmann, and RK Singh

(3) Anon; Private Communication from G Sabde

(4) Babel, A; submitted for publication

(5) Bielmann, M; Electrochemical and Solid-state Letters 1999, V2(3), P148 HCAPLUS

(6) Braun, A; Semiconductor International 1998, V21, P65

(7) Campbell, D; CAMP Newsletter 1994, V10, P1
 (8) Free, M; Micro 1998, May, P29

L39 ANSWER 32 OF 34 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1998:242076 HCAPLUS
 DN 128:285577
 ED Entered STN: 29 Apr 1998
 TI Cerium oxide abrasive and polishing of substrates
 IN Yoshida, Masato; Matsuzawa, Kiyoshi
 PA Hitachi Chemical Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 4 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C09K003-14
 ICS C01F017-00; C08K003-22; C08L101-00; C09C001-68; H01L021-304
 CC 57-7 (Ceramics)
 Section cross-reference(s): 76
 FAN.CNT 1

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------------|------|----------|-----------------|----------|
| PI JP 10102040 | A2 | 19980421 | JP 1996-258769 | 19960930 |
| PRAI JP 1996-258769 | | 19960930 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|-------------|-------|--|
| JP 10102040 | ICM | C09K003-14 |
| | ICS | C01F017-00; C08K003-22; C08L101-00; C09C001-68; H01L021-304 |

AB Ce oxide particles containing $\geq 90\%$ primary particles showing contours containing angular parts smaller than 120° in observation by transmission type electron microscope are dispersed in water, and the Ce oxide particle slurry is used as abrasive for polishing of substrates optionally having SiO₂ insulating layer. Optionally, the slurry contains a dispersant selected from water-soluble organic polymer, water-soluble anionic surfactant, water-soluble nonionic surfactant, and water-soluble amine.

ST cerium oxide abrasive silicon substrate polishing

IT Surfactants
 (anionic, dispersant; polishing of silicon substrate by slurry-form cerium oxide abrasive containing)

IT Amines, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (dispersant; polishing of silicon substrate by slurry-form cerium oxide abrasive containing)

IT Surfactants
 (nonionic, dispersant; polishing of silicon substrate by slurry-form cerium oxide abrasive containing)

IT Polishing
 (of silicon substrate; slurry-form cerium oxide abrasive for)

IT Abrasives
 (slurry-form cerium oxide abrasive for polishing silicon substrate)

IT 9003-03-6, Ammonium polyacrylate
 RL: TEM (Technical or engineered material use); USES (Uses)
 (dispersant; polishing of silicon substrate by slurry-form cerium oxide abrasive containing)

IT 7631-86-9, Silica, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(polishing of silicon substrate coated with; **slurry**
-form cerium oxide **abrasive** for)

IT 7440-21-3, Silicon, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(polishing of substrates of; **slurry**-form cerium
oxide **abrasive** for)

IT 1306-38-3, Cerium oxide, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**slurry**-form cerium oxide **abrasive** for
polishing silicon substrate)

L39 ANSWER 33 OF 34 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1997:248770 HCAPLUS
DN 126:350637
ED Entered STN: 17 Apr 1997
TI A study of post-chemical-mechanical-polish cleaning strategies
AU Huynh, C.; Rutten, M.; Cheek, R.; Linde, H.
CS Microelectronics Div., IBM, Essex Junction, VT, 05452, USA
SO Proceedings - Electrochemical Society (1997), 96-22(Chemical Mechanical
Planarization), 16-26
CODEN: PESODD; ISSN: 0161-6374
PB Electrochemical Society
DT Journal
LA English
CC 77-3 (Magnetic Phenomena)
Section cross-reference(s): 66
AB Chemical Mech. **Polishing (CMP)** has emerged as the premier
technique for achieving both local and global planarization. One of the
primary concerns in the use of **CMP**, however, is the efficient
and complete removal of **CMP** contaminants such as **slurry**
and residual hydrocarbons. This paper discusses the removal of
silica-based **slurries** utilized for polysilicon and oxide
CMP processes. The effects of mech. brush cleaning, chemical
treatments, and **polish** processes on defect d. for a 16Mb memory
technol. are presented. In addition, the chemical compatibility of
polishing slurries with various brush and
polishing pad materials is discussed.
ST silicon wafer chem mech **polishing** cleaning
IT Memory devices
(RAM (random access); post-chemical-mech.-**polish** cleaning
strategies for silicon wafers)
IT **Polishing**
(chemical-mech.; post-chemical-mech.-**polish** cleaning strategies for
silicon wafers)
IT **Surfactants**
(nonionic; post-chemical-mech.-**polish** cleaning
strategies for silicon wafers)
IT Cleaning
Semiconductor devices
(post-chemical-mech.-**polish** cleaning strategies for silicon
wafers)
IT **Abrasives**
(**slurry** removal; post-chemical-mech.-**polish** cleaning
strategies for silicon wafers)
IT 7440-21-3, Silicon, processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical
process); PROC (Process); USES (Uses)
(post-chemical-mech.-**polish** cleaning strategies for silicon
wafers)

IT 75-59-2, TMAH
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (post-chemical-mech.-polish cleaning strategies for silicon
 wafers)

IT 7631-86-9, Silica, processes
 RL: DEV (Device component use); PEP (Physical, engineering or chemical
 process); PROC (Process); USES (Uses)
 (slurry removal; post-chemical-mech.-polish cleaning
 strategies for silicon wafers)

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

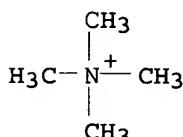
- (1) Ali; Microcontamination 1994
- (2) Ali, I; Semiconductor Intl 1990, P92 HCAPLUS
- (3) Blackwell, R; US 5320706
- (4) Bowling, R; J Electrochem Soc 1995, V137, P2208
- (5) Cook, L; J Non-Crystalline Solids 1990, V120, P152 HCAPLUS
- (6) Huynh; "CMP Clean Process Engineering, CMP Clean Evaluation," Presented at
 Sematech Surface Prep PTAB Meeting 1993
- (7) Huynh, C; 1993 Research/TP Symposium on Silicon Technology 1993
- (8) Huynh, C; U S Patent Pending
- (9) Iler, R; The chemistry of Silica 1979, P366
- (10) Jeon, J; Belgium Semiconductor Symposium 1995
- (11) Park, J; Microcontamination Conference 1992
- (12) Roy; J Electrochem Soc 1995, V142, P216 HCAPLUS
- (13) Singer, P; Wafer Processing News, Semiconductor Intl 1995

IT 75-59-2, TMAH

RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (post-chemical-mech.-polish cleaning strategies for silicon
 wafers)

RN 75-59-2 HCAPLUS

CN Methanaminium, N,N,N-trimethyl-, hydroxide (9CI) (CA INDEX NAME)



● OH⁻

L39 ANSWER 34 OF 34 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1995:582574 HCAPLUS
 DN 122:320762
 ED Entered STN: 02 Jun 1995
 TI Synthetic diamond-based polishing suspension for semiconductors
 IN Komarov, Vitaly Fedorovich; Sakovich, Gennady Viktorovich; Petrov, Evgeny
 Anatolievich; Klimov, Anatoly Valentinovich; Kostjukov, Sergei Ivanovich;
 Baraboshkin, Konstantin Sergeev
 PA Nauchno-Proizvodstvennoe Obiedinenie "Altai", Russia
 SO PCT Int. Appl., 18 pp.
 CODEN: PIXXD2
 DT Patent
 LA Russian
 IC G09G001-02; C09G001-08

CC 57-6 (Ceramics)

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---|------|----------|-----------------|----------|
| PI | WO 9422970 | A1 | 19941013 | WO 1994-RU68 | 19940401 |
| | W: BY, CA, JP, UA, US RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE | | | | |
| | RU 2034889 | C1 | 19950510 | RU 1993-12940 | 19930402 |
| PRAI | RU 1993-12940 | A | 19930402 | | |

CLASS

| | PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|--|------------|-------|------------------------------------|
| | WO 9422970 | IC | G09G001-02IC C09G001-08 |
| | WO 9422970 | ECLA | C09K003/14B |

AB The invention concerns a polishing compound for giving a superfinish to surfaces, containing 5-10% of an abrasive component suspended and a liquid medium. The abrasive component is a synthetic diamond-containing material with specified properties in which the primary particles are 4-6 nm in size and combine to form aggregates of 20-500 nm in size, with sp. surface areas of 250-450 m²/g and pore volume of 0.6-1.0 cm³/g. A typical composition contained the above abrasive material 5-10, glycerol or diethylene glycol 10-15, H₂O₂ 5-15, ethylenediamine 0.1-1.0, and KOH or NaOH 1-3% in H₂O.

ST diamond synthetic polishing suspension; glycerol synthetic diamond polishing suspension; hydrogen peroxide diamond polishing suspension; hydroxide synthetic diamond polishing suspension

IT Polishing materials
(synthetic diamond-based polishing suspension for semiconductors)

IT Petrolatum
Waxes and Waxy substances

RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(synthetic diamond-based polishing suspension for semiconductors)

IT Polishing
(chemical-mech., synthetic diamond-based polishing suspension for semiconductors)

IT Alcohols, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(long-chain, ethoxylated, synthetic diamond-based polishing suspension for semiconductors)

IT 148-24-3, 8-Hydroxyquinoline, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(saturated aqueous solution; synthetic diamond-based polishing suspension for semiconductors)

IT 56-81-5, Glycerol, uses 107-15-3, Ethylenediamine, uses 111-46-6, Diethylene glycol, uses 112-80-1, Oleic acid, uses 1310-58-3, Potassium hydroxide, uses 1310-73-2, Sodium hydroxide, uses 7631-86-9, Aerosil, uses 7722-84-1, Hydrogen peroxide, uses 9003-11-6, Ethylene oxide-Propylene oxide copolymer 11099-07-3, Stearin 12751-48-3, Syntanol 25322-68-3D, Polyethylene glycol, ethers, with fatty alc. 31566-31-1, Glycerol monostearate
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(synthetic diamond-based polishing suspension for

semiconductors)

IT 7782-40-3, Diamond, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(synthetic; synthetic diamond-based polishing suspension for
semiconductors)

IT 7631-86-9, Aerosil, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material
use); USES (Uses)
(synthetic diamond-based polishing suspension for
semiconductors)

RN 7631-86-9 HCAPLUS

CN Silica (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

=> SAVE L39 GOU807/A
ANSWER-SET L39 HAS BEEN SAVED AS 'GOU807/A'

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